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Market Studies of United States

Opportunities in Offshore Drilling Equipment and Technology in Southern California

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August 1984

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SOUTHERN CALIFORNIA OFFSHORE DRILLING

EQUIPMENT AND TECHNOLOGY OPPORTUNITIES STUDY

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1.0 EXECUTIVE SUMMARY

1.1 Objectives

The main object of this study was to focus specifically on the equipment, specifications and technology requirements of the offshore California oil and gas industry, in relation to export opportunities for Canadian industry.

The following report seeks to outline current and future activities in the Diatomite Region of Coastal Southern California, identifying key companies and contacts with respect to design, specification and buying decisions. Evaluation of market potential for Canadian drilling equipment and technology was based on Schedule '1' provided by the Department which is included, in expanded form, in Appendix 'I'.

1.2 Purpose of Study

- To provide interested organizations and exporters with a practical working document upon which to base a corporate export strategy.
- To provide a detailed information base with which the Canadian Government may assist industry with export initiatives.

1.3 Introduction

The main areas of offshore activity are in the Santa Maria Basin, the Santa Barbara Channel, and off Long Beach in San Pedro Bay, all as indicated on the adjoining sketch maps. Additional information on individual platform deployment is also provided, giving up-to-date locations of proposed, installed and producing rigs.

Further supplementary information on the Offshore Industry and Onshore Facilities is provided in Appendix 'A', together with details on Active Leases, Fields, Units, Platforms and Operators issued in Sept., 1983, by the U.S. Department of the Interior - Minerals Management Service. This has also been updated to reflect recent developments. In addition, for general reference and guidance, Appendix 'B' provides details of Active and Inactive Leases together with Bathymetric Information issued in Sept., 1983, by the U.S. Department of the Interior - Minerals Management Service.

Crude oil production, offshore California, is mainly from the Monterey formation which, on average, is about 1000 ft. thick and 8000 ft. below mud-line. This formation is highly fractured dense rock with limited matrix permeability having significant effect on recovery techniques required.

The fractured nature of the rock formation results in good flow to production wells but minimal pressure available to lift oil to the surface. Artificial lift is therefore commonly required together with a gravel pack to minimize sand production.

The effectiveness of water flooding or other enhanced recovery techniques is complicated by the fractured nature of the reservoir, resulting in a general tendency to use submersible downhole pumps to increase productivity when required.

The structure of this report has been designed specifically to provide a practical working document giving exporters ease of access to information which may be particularly relevant to them.

Section 2 - Market Overview - is intended to cover the whole industry spectrum, step by step, addressing individual centres as necessary. Where relevant, some comment on political/environmental considerations is also made.

Section 3 - Key Entities - summarizes the main organizations involved, again, across the whole industry spectrum, giving exporters ease of access to fields of particular interest. More detailed references are given under Appendix 'L' - Industry Directories.

Section 4 - Equipment and Technology - itemizes, in general terms individual pieces of equipment to assist exporters in selection of a particular market they would like to address. This section has been sub-divided into the general fields of Drilling Equipment, Power and Utility Equipment, Process Equipment and Consumables. Additional supportive data is given in Appendix 'J'.

Section 5 - Equipment Purchasing Channels and Methods - addresses the general aspects of procurement in the oil industry with separate approaches to platform construction and installation, since a natural contractual division occurs between these sectors.

Section 6 - California Market - addresses the domestic industry as established in California with intent of allowing exporters some assessment of the competition.

Section 7 - Pricing - deals with costs to which exporters may be subject including exchange rate fluctuation, transportation, duties, tariffs and fees. Supplementary tariff schedules are also included in Appendix 'K'. This section concludes by outlining a step-by-step pricing structure with major points considered to have bearing on the market contemplated.

Section 8 - Marketing Strategies - addresses the opportunities and the most likely means by which Canadian industry might access the California oil market, together with point form recommendations on representation in a highly competitive environment.

Section 9 - Appendices - provides comprehensive support documentation which is referred to continually throughout the text of this report.

In researching the information in this report, discussions were held with the following government bodies and organizations:

: U.S. Department of the Interior, Minerals Management Service

: U.S. Department of Commerce including:-
  - U.S Bureau of the Census
  - U.S. Industrial Outlook
  - U.S. Dept. of County Business Patterns

: U.S. Customs

: County of Santa Barbara

: Local port authorities

: California Costal Operators Group

: Oil companies

: Supply Houses

: Canadian Exporters

Additionally, a comprehensive review of weekly and monthly publications was carried out, contributing substantially to the general information content of this report.

1.4 Market Opportunities

Based on knowledge of existing reserves and the present stage of development, excellent opportunities exist in drilling equipment and technology for offshore, southern California. With continued favourable interest in developing offshore reserves, it is anticipated that some $10 billion of offshore platforms will be installed over the next seven years with production demand peaking in the early 1990's.

In support of some 11 platforms offshore, it is currently anticipated that three tanker terminals, three major pipelines, upgrading of several refineries and establishment of improved offshore oil supply bases facilities will be carried out over the next decade. Area masterplans are currently under review to include such developments.

Historically, foreign imports to the U.S. oil and gas industry have constituted a small percentage of domestic expenditure. In particular, product code SIC 3533 - Oilfield Machinery, showed imports from all countries to the U.S. in 1983 of only 0.6% of domestic consumption totalling $3579 million. Opportunity for competitive Canadian exports in this area is therefore excellent and particularly so, given the anticipated growth in the California region. The U.S. Industrial Outlook has predicted a 4% yearly increase in oilfield manufacturing over the next five years.

The low gravity, high sulphur crude oil product, typical of the offshore Monterey formation, presents problems in handling and processing that are not new to the industry. However, Canadian companies have been involved in the forefront of heavy oil technology and should be able to offer competitive developments in some areas. The increased water depths now being considered prompt development of improved subsea technology with particular reference to low-gravity, high-sulphur oils. Additionally, given the nature of the Monterey formation, enhanced recovery techniques usually result in the use of submersible downhole pumps. Further innovative work on enhanced recovery techniques would also be beneficial to the offshore California industry.

Good opportunity currently exists for Canadian products to be competitive in the offshore California market but manufacturers should be wary of artificial margins introduced under recent economic pressures to help move stock. Of the Canadian owned companies polled by questionnaire, 48% were exporting to the U.S.A. in general and only 19% to California in particular. Discussions with U.S. purchasers suggest a real need to improve Californian awareness of Canadian products, and to be able to demonstrate good deliveries and dependable back-up service. If price differences were only marginal, purchase decisions were more likely to be based on quality, dependability, delivery, after sales service etc. Of those who were aware of Canadian products, none expressed dissatisfaction and some recognized the more robust nature of some Canadian designs.

'Old boy' networks and 'buy American' attitudes exist within the industry but not to a level that should deter an exporter. Discussions with U.S. purchasers indicate that, in general, competitive or reasonable prices for quality products and dependable service would always succeed.

1.5 Overall Strategy

The thrust of this study has been directed toward opportunities that exist, which offer potential for sales of oil and gas industry equipment, technology and service in the southern California offshore region.

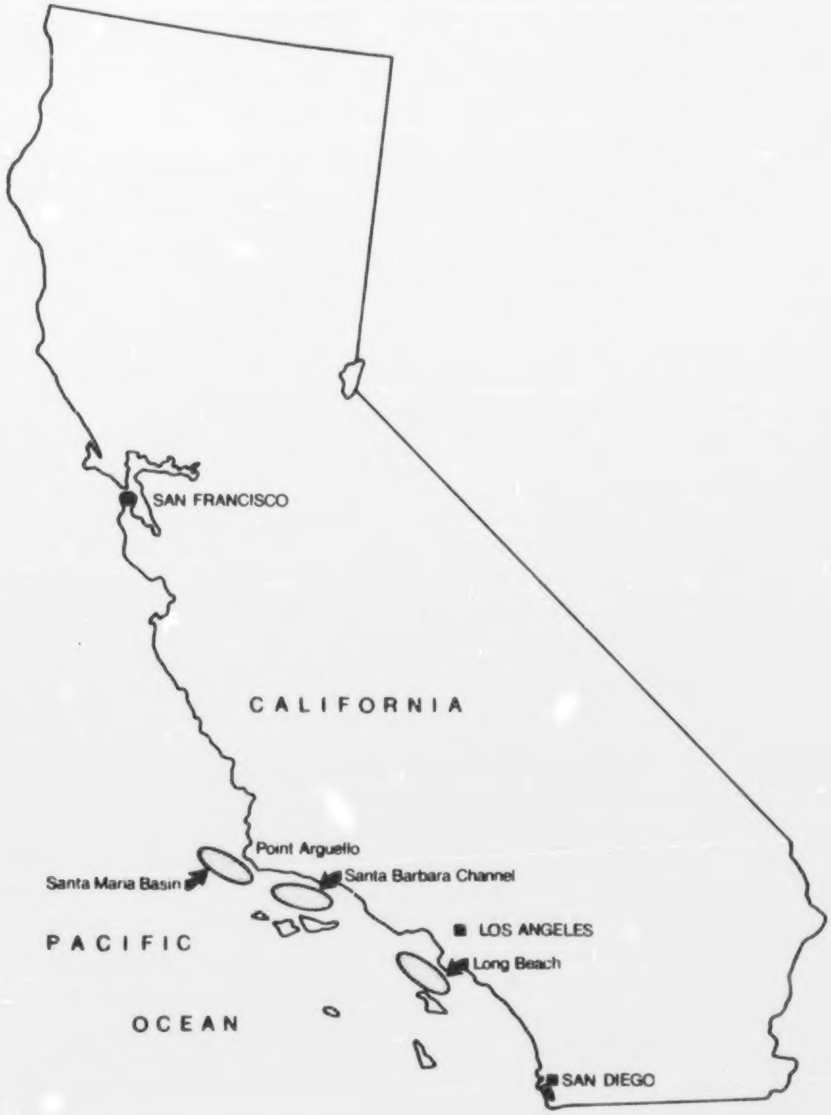
Given the openness, sophistication and competitiveness of the California market, a sustained marketing effort by Canadian industry will be the most important element in achieving improved export sales.

This report sets out comprehensive guidelines on the key elements for assembling a total market strategy sufficient to allow Canadian oil and gas industry to become aggressively involved in the economic expansion of this area. The overall strategy should culminate in establishing a long term presence in which consumers have confidence.

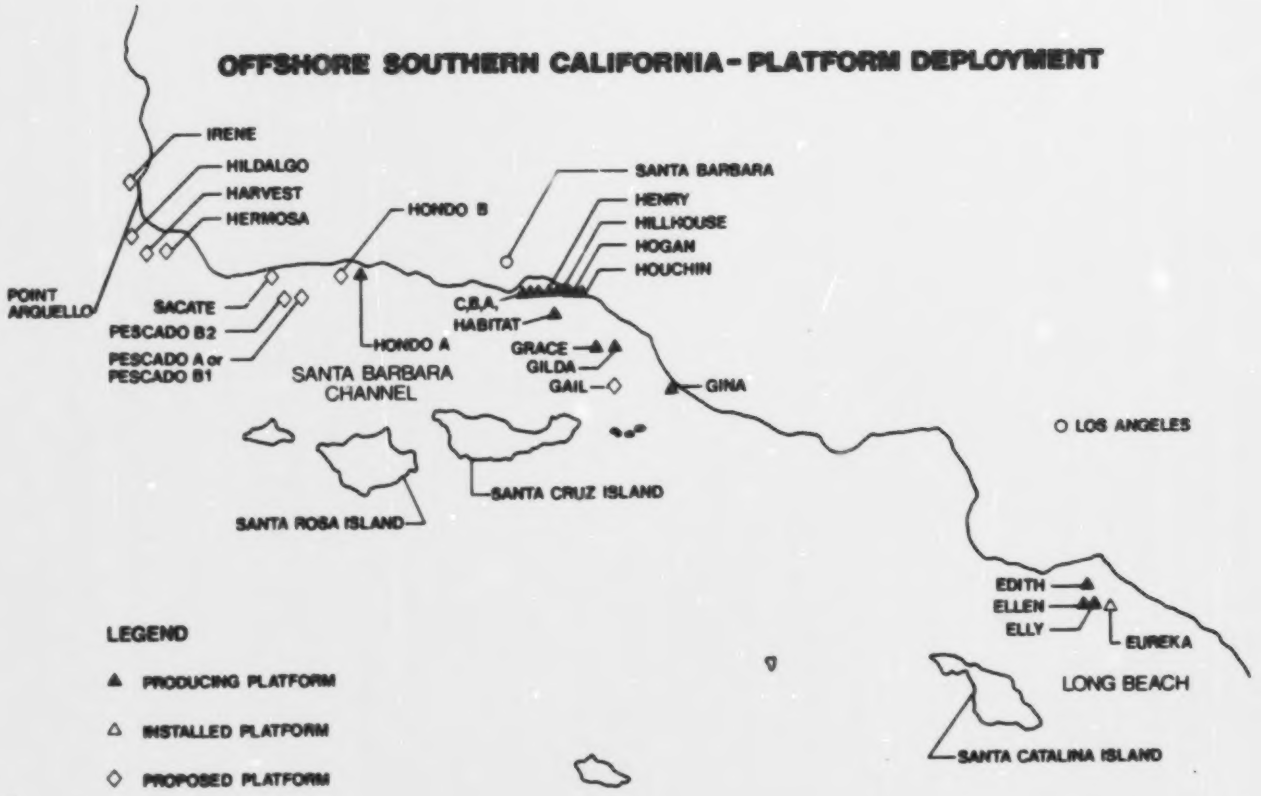
Exporters are encouraged to use the PEMD program to carry out market assessments, to participate in trade fairs, and to sustain export market development. The ongoing counselling and assistance available from government trade officials, regional offices and the Canadian Consulate General are also of benefit to this development.

Given the information gathered into this report following discussions with Canadian/U.S.A. business and associations, there is every reason to expect that, with aggressiveness, persistence and adaptability to the needs of the market, Canadian industry can achieve sustained growth of sales in the area.

OFFSHORE SOUTHERN CALIFORNIA—ACTIVITY AREAS


SAN FRANCISCO
CALIFORNIA
Point Arguello
Santa Maria Basin
Santa Barbara Channel
LOS ANGELES
PACIFIC
Long Beach
OCEAN
SAN DIEGO

OFFSHORE SOUTHERN CALIFORNIA - PLATFORM DEPLOYMENT



IRENE
HILDALGO
HARVEST
HERMOSA
POINT ARGUELLO
SACATE
PESCADO B2
PESCADO A or PESCADO B1
HONDO B
HONDO A
SANTA BARBARA CHANNEL
SANTA BARBARA
HENRY
HILLHOUSE
HOGAN
HOUCHIN
C.B.A.
HABITAT
GRACE
GILDA
GAIL
GINA
SANTA ROSA ISLAND
SANTA CRUZ ISLAND
O LOS ANGELES
EDITH
ELLEN
ELLY
EUREKA
LONG BEACH
SANTA CATALINA ISLAND
LEGEND
▲ PRODUCING PLATFORM
△ INSTALLED PLATFORM
◇ PROPOSED PLATFORM

2. MARKET OVERVIEW

2.0 MARKET OVERVIEW

2.1 Petroleum Products

The Monterey formation generally produces a heavy grade crude oil in the 10 to 16 degree API gravity range with the majority in the 15/16 degree category. Texaco and Chevron finds in the Arguello area have indicated oil gravities as high as 34 degrees API. The oil is also heavily sulphur-laden giving rise to additional handling problems. Oil from the more southerly regions, namely Santa Barbara Channel and Long Beach, has a lower sulphur content than the Point Arguello area.

Most gas is heavily sulphur-laden and is normally produced with the oil. However, as a noteable exception, Texaco's Habitat platform produces solely gas which is essentially sweet and dry.

To stabilize the crude oil prior to the long pipeline transportation to a refinery, several treatment facilities have been proposed. These facilities will further separate the oil/gas/water combination and remove sulphur. The processing facilities offshore are, for economic reasons, kept to a minimum with generally only first stage separation being provided for oil/water and gas.

2.2 Reserves

The estimated recoverable reserves offshore Southern California are contained primarily in the Pt. Arguello, Santa Barbara and Long Beach areas and are conservatively estimated at about 1 billion barrels of oil and 2 trillion cubic feet of gas.

The total offshore Southern California production, based on present reserves, could be as high as 400,000 bopd by the early 1990's. About 200,000 bopd of this production would come from the Pt. Arguello area, 150,000 bopd from Santa Barbara Channel and 50,000 bopd from the Long Beach areas. It is expected that this production, about 1/3 of the current state production, would peak in the early 1990's and decline by 2000.

2.3 Exploration

The exploration activity offshore Southern California is currently relatively low. The operators have plans to drill more wells on existing acreage but maintain that more acreage must be made available through lease sales for future exploration to increase.

Seismic work is generally undertaken from vessels prior to drilling exploration wells. These vessels are not regulated by the Jones Act and could therefore be under Canadian flag. It should be noted that there is an abundance of such vessels on the Gulf Coast and competition is therefore very strong. Again, such work would only follow after additional acreage is made available through lease sales.

Over 20 exploration vessels have been working offshore Southern California simultaneously within the past year but in the present slowdown, only six are operational. The present slowdown is due in part to leasing and regulatory delays and in part to the effort being expended on installation of new production platforms. Several firms, including Arco, have recently given up leases in the Santa Maria basin, just north of Pt. Arguello, due to a dispute between federal and state governments. Lease offerings in the past few years have generally been for limited land areas and have received only "lukewarm" reception by the industry due to regulatory pressures.

Recent exploration activity has been concentrated off Pt. Arguello, in the western end of the Santa Barbara Channel, where in 1981, Chevron discovered a major oil reserve in 1050 ft. of water. Most of the proposed exploration and production activity is scheduled for this area, with Chevron and Texaco being the key participants.

The development schemes proposed to date are in about 1,100 ft. of water and rely on conventional, piled steel jacket technology. Studies have also been conducted on the use of TLP (Tension Leg Platform) and guyed tower concepts. Due to the relatively poor crude characteristics adding to potential maintenance problems, subsea completions are not currently advocated. However, as deeper water areas are explored and developed, this may change. Phillips have used some subsea wells to exploit the Molino offshore gas field.

A total of 21 exploration wells are scheduled to be drilled in the near future; 19 in the Pt. Arguello area and 2 in the Long Beach area. The wells are tending towards greater water depths (1,000 ft.) and will likely be drilled from either semi-submersibles or drill ships. Jack-ups cannot be used in water depths over about 350 ft. The manoeuverability of floating rigs together with the present world market on rig availability is such that no new equipment will be required for planned exploration.

Appendix 'C' gives a schedule of Californian Offshore Drilling Activities indicating which companies are drilling where and to what depth. General comments on well type, flow rates, oil gravities etc., are also given.

2.4 Production

Exploration offshore Southern California began in the late 1800's and to date, there are some 20 production platforms installed in water depths up to 850 ft., producing a total of about 90,000 bopd.

Appendix 'F' provides a comprehensive schedule of Existing Offshore Production Platforms indicating companies, platform field bases, water depths, offshore distances, production rates, well slots plus general comment on operations.

Given the reserves indicated in 2.2, it is estimated that, to recover the oil over the indicated time scale, an additional 11 production platforms will be required. This would mean 5 for Pt. Arguello, 3 for Santa Barbara and 3 for Long Beach. These developments are itemized specifically under Appendix 'E' indicating both current and future construction schedules.

With regard to specific equipment on these platforms, reference should be made to Section 4 - Equipment and Technology of this report.

2.5 Transportation and Refining

So far, production offshore California is relatively small scale and has not required extensive modifications to existing local refineries. However, the planned expansion for the area will require new or upgraded refineries to handle the type and volume of oil produced.

Present alternatives involve transportation to a location where existing refineries can handle the increased production. This would be either in San Francisco, Los Angeles or Texas.

To move the oil to existing refineries in either San Francisco or Los Angeles, several schemes for connecting into an existing pipeline network have been proposed which are individually covered in Appendix 'G' - Summary of Onshore Facilities.

To move production to the refineries in Texas, the All-American pipeline has been proposed. Recently, permits for most of the 1,100 mile pipeline have been obtained and construction is expected to begin in 1985. Permits are yet to be obtained for the Emidio to Las Flores section within Santa Barbara County. The All-American pipeline is currently the Regulatory Agencies' preferred scheme for oil transportation to existing Texas refineries since it results in minimal crude handling when compared to tanker transportation. However, Chevron has recently won interim approval for crude oil tankering to the Gulf to allow early production off Pt. Arguello, while a pipeline is built.

At present, all production, except that from Exxon's Hondo A platform, is piped to shore (generally less than 10 miles) and into an existing network of pipelines which lead to recently constructed or upgraded refineries. The crude produced at Hondo A is pipelined to the Offshore Storage and Treating (OS&T) vessel which is moored to a SALM (single anchor leg mooring), where it is processed and stored for shuttle tanker pickup and transfer to Gulf refineries.

At present, there are 13 marine terminals in the Southern California region as shown in Appendix 'L'. These terminals are relatively small scale and none have the capability of handling the projected field production rates.

Appendix 'G' - Summary of Onshore Facilities, condenses known proposals for development of oil transportation facilities under company headings and is supplemented by a series of localized maps and other data which have general information value to potential exporters.

2.6 Consumables

Consumables supply bases for offshore oil activities will likely be based in the existing ports of Long Beach, Hueneme and Gaviota. However, to accommodate the expected tripling of offshore services required by the early 1990's, some expansion will be required. Maximum demand for port space is expected in the early 1990's as exploration and production drilling peaks. A sharp fall-off in activities is expected shortly thereafter. Masterplans are currently being prepared and updated for these areas and approvals for development are being sought. Consumables supply facilities require mainly flat storage and working areas with clear dock frontage accessible by medium capacity cranes, fork lifts and low tonage oil supply vessels.

The supply of consumables will be a temporary market with two main components:

- exploration wells
- production wells

Consumables for exploration wells are normally carried with the drilling platforms which require minimal resupply. However, as exploration continues some re-supply may be required; the amount depending upon availability of new lease acreage for drilling. The next OCS lease sale is scheduled for October, 1984 and a peak demand could follow shortly thereafter when operating companies rush to explore newly acquired acreage.

Consumables for production wells should be maintained at a fairly constant level for several years after the platform is installed. With two drilling rigs typically on each production platform, the demand would be twice that for an exploration platform. As shown in Appendix 'E', about 11 platforms are intended to be installed over about a 7 year period. Demand for production supply should therefore persist for the next 10 years, peaking in the early 1990's.

2.7 Construction

The optimum location for construction of platforms will depend on the selected concept, but for steel jacket fabrication, the Far East yards have been more economical than their North American counterparts. Nevertheless, there are new construction facilities in various stages of development in:

- Mexico by McDermott, Inc.
- Mexico by B.G. Offshore
- Astoria, Oregon, by Astoria Oil Services
- Coos Basy, Oregon, by Pacific Arctic Constructors, Inc.
- Humboldt Bay, Californfia, by Brown & Root, Inc.
- Terminal Island, California, by Kaiser
- Humboldt Bay, California, by Exxon

Exxon does not intend to build platforms themselves but has leased the land for sublet to a contractor when required. There are another 15 facilities on the West Coast with capability of module fabrication which also enjoy the competitive advantage of shorter tow routes. However, recent contract awards in the Far East suggest that there are still savings to be made by having jacket and topsides fabricated outside the U.S. even while incurring expensive trans-Pacific tow costs. Furthermore, there are no barges on the West Coast capable of deploying a major jacket, although Kaiser is having one built just now in the Far East.

For general guidance on existing and future construction activity, further reference should be made to Appendices 'D' and 'E' of this report.

2.8 Political and Environmental Considerations

Present political pressures appear to support development of offshore California and through Secretary Watt, large amounts of acreage were originally being offered in lease sales for exploration. However due to environmental group pressures, delays to several of such lease sales have been achieved.

The major environmental concerns are maintenance of water and air quality, both of which are monitored continuously at shore stations to ensure neither is adversely affected by new activities.

Recently, U.S. Interior Secretary, William Clark announced that a somewhat reduced OCS Sale 80 will likely proceed in late October, 1984, and industry executives reported a "new spirit of cooperation with regulatory agencies, politicians, environmental and other interests regarding the offshore development/ transportation proposals" for Southern California. These factors will likely renew exploration drilling interest in this area where recent activity has been relatively sluggish.

A recent report in an industry journal commented that opposition to leasing off virgin areas of the central coast and San Diego County area will remain adamant. The report continued by adding that industry's chances were a little better in the far northern basins, where citizens affected by depressed local economies might become more supportive if educated on the economic benefits that might accrue from OCS leasing.

3. KEY ENTITIES

3.0 KEY ENTITIES

Appendix 'L' comprises selected information primarily extracted from FOUST'S Sales and Service Directory which is a comprehensive catalogue of the industry and agencies involved with offshore oil in California. Further information on availability of this directory is given in this Appendix.

This directory sets out to catalogue and index all parties who have an interest, however large or small, in the Californian oil industry. In consequence, due care and consideration should be exercised in use of this directory noting that different organizations can vary enormously in size and capacity. In assembling Appendix 'L' as an extract of Foust's Directory, some attempt has been made to identify the more significant participants and the information provided should not be considered limiting.

Additionally, the WESTERN UNITED STATES (INCLUDING ALASKA) PETROLEUM INDUSTRY YELLOW PAGES is referenced in Appendix 'L' together with a brief content outline.

In view of the vast number of manufactured items involved in fabrication and operation of a multi-million dollar offshore drilling and production platform, it is not possible, within the scope of this report, to direct equipment manufacturers towards an optimum market approach. However, equipment can be divided into general categories as listed below and as per Appendix I, but it is not possible to define a particular market approach that would apply to each category.

A summary of potential U.S. purchasers is as follows:

OIL COMPANIES	- division purchasing office - regional drilling office - regional production office - purchasing agent assigned to consultants office
SERVICE COMPANIES	- logging - cementing - directional drilling - mud engineering - wirelining - fabricators - design consultants - drilling contractors

Exporters should study the available data in this Section and Appendix 'L' in relation to their particular field of operation and plan their marketing strategy. (See Section 8).

The Key Entities involved are summarized in Appendix 'L' as follows:-

Section 1 - Government/Regulatory Agencies - Included for information and considered unlikely that this will be of particular use to exporters.

Section 2 - Drilling Companies - Sets out to indicate the more prominent organizations with contacts who specifically contract their services out to oil companies.

Section 3 - Operating Companies - Indicates the more prominent oil companies and contacts known to be active in the offshore sphere.

Section 4 - Consultants - Provides a full listing of consultants involved to varying degrees in the oil industry. Potential exporters should consider this listing for their product mailing list.

Section 5 - Refineries - Provides a listing of all refineries currently operating in California. Further general comment is made under Section 2 - Market Overview.

Section 6 - Terminals & Supply Bases - Provides a County listing of marine terminals in Southern California.

4. EQUIPMENT AND TECHNOLOGY

4.0 EQUIPMENT AND TECHNOLOGY

4.1 Preamble

The following sub-sections have been developed for typical California offshore platforms:

:	Drilling Equipment	(4.2) - Also Appendix 'J'
:	Power and Utility Equipment	(4.3) - Also Appendix 'J'
:	Process Equipment	(4.4)
:	Comsumables	(4.5)
:	Standards and Regulations	(4.6)

Discoveries to date have been in water depths such that the use of steel jacket platforms or variations thereof is appropriate for production. Operators cannot extensively explore deeper water beyond 1200 ft. until the lease sale acreage is made available.

There is currently considerable technological effort worldwide in deep water engineering with Canadian firms involved in some developments. Concepts which have been developed include subsea production, tension legged platforms (TLP), guyed tower and several compliant concepts.

With the exception of subsea, the use of all concepts is relatively straightforward compared to other worldwide deep water areas. Due to the nature of the heavy crude product and the present state of subsea technology, confidence in subsea production for this area is lacking. Research on potential production problems and associated maintenance procedures would be welcomed by the industry.

Additional work on enhanced recovery techniques would also be beneficial to offshore Californian industry.

4.2 Drilling Equipment

In discussing complete equipment requirements for an offshore California platform, drilling equipment can be viewed almost independently of other platform facilities. This is in part due to full drilling facilities being required only for approximately five of the twenty year life of the platform and in part due to independent drilling contractors specifying, purchasing, building and operating their own equipment. The rigs are therefore normally removed on completion of the drilling programs if not purchased by the oil company for future downhole work.

A typical drilling rig equipment list is given in Appendix 'J' - Section (a). Derricks have a 1,000,000 lb. hook load rating with 2,000 HP draworks, two 1,600 HP triplex mud pumps, plus 5,000 psi and 2,000 psi BOP's. Equipment will vary depending on number and depth of holes, water depth, anticipated drilling conditions and drilling contractor equipment preferences.

The use of chains is permitted offshore California. Complete hydraulic pipehandling systems with upper and lower racking arms or a casing stabbing arm are not common.

The list in Appendix 'J' is for a single drilling rig on a platform. Platforms such as Union's Gilda and Shell's Ellen have two rigs operating for either all or part of the drilling program.

4.3 Power and Utility Equipment

Appendix 'J' - Section (b) contains a list outlining typical platform power and utility equipment. Average sizes and capacities are indicated. This list includes such support equipment as radio and communications, crew facilities, emergency equipment and helicopter landing and refueling facilities.

The size and capacity of this equipment largely depends on the extent of the processing facilities included in the platform design and whether or not support utilities are included in the drilling rig package. Potable water, steam, compressed air and electricity may be provided from the platform for the drilling rig or may be supplied by the drilling contractor for his own use.

Although the equipment will vary between platforms, the typical lists in Appendix 'J' will give the Canadian equipment manufacturer a guide as to the type of support equipment required offshore California.

4.4 Process Equipment

The extent of oil processing on each offshore platform varies considerably, ranging from simple oil/gas separation to complex gas separation, dehydration, stabalizing, sweetening and crude oil treatment. Equipment is therefore discussed in general terms for respective platforms giving some indication of processing facilities likely to be installed and commissioned during the next three years.

Chevron's Platform - GAIL

- for the Sockeye Field (OCS-P0205) in the Santa Clara Unit in 740' water
- to be installed late 1986 (just after Hidalgo)
- first production in April 1987
- topsides design by Brown and Root
- jacket design by Brown and Root
- topsides fabrication bid January 1985, to be awarded June, 1985
- jacket fabrication out for bid August, 1984
- drilling contract not yet awarded - contractor to build and own the rig
- production to platform Grace via 8" gas line and 8" oil line and from Grace via 10" gas line and 12" oil line to shore. Oil goes to refinery in L.A., gas to sales line near Carpinteria
- production equipment on Gail
    - oil/free water/gas separation
    - test separators
    - coalescer treaters
    - LACT unit
    - gas dehydration
    - fuel gas sulphur removal
    - gas compression

Chevron's Platform - HIDALGO

- for the Pt. Arguello field (OSC-P0450) in 430' of water
- jacket to be launched in June 1986
- topsides installation in 4th quarter 1986 (just before platform Gail)
- first production, first quarter 1987
- topsides design by Bechtel
- jacket design by Bechtel
- topsides fabrication
  - bid in December 1984
  - to be awarded in April 1985
- jacket fabrication
  - not yet awarded
- drilling contract
  - not yet awarded
  - contractor will build and own his own rig
- production to platform Hermosa via 12" gas and 12" oil line
- production by electric submersible pump - no waterflood planned
- production facilities on Hidalgo
  - oil/free water/gas separation
  - test separation
  - LACT unit
  - gas dehydration (glycol)
  - sulphur removal for fuel gas only
  - gas compression
  - no water treatment (dumped into ocean)

Chevron's Platform - HERMOSA

- in Pt. Arguello Field (OSC-P316) in 602' of water
- to be installed mid 1985
- first production, 1st quarter 1986
- topsides design by Fluor
- installation of jacket by Heerema
- topside fabrication and commissioning by McDermott (Morgan City, Louisianna)
- jacket fabrication by Hitachi
- drilling contract not yet awarded - rig will be built and owned by drilling contractor
- Hermosa will take production from Texaco's Harvest Platform via an 8" gas line plus 12" oil line and from Chevron's Hidalgo platform
- production from Hermosa via 22" gas line and 30" oil line, 10 miles to shore, Landfall is Pt. Conception, thence to a new joint interest plant at Gaviota due onstream in 1986
- produce water is dumped overboard (note-this is not allowed in state waters)
- no water injection or gas lift planned - downhole submersible electrical pumps used for production
- production facilities of Hermosa
    - oil/free water/gas separation
    - test separation
    - LACT unit
    - all gas dehydrated (glycol)
    - sulphur removal by amine process for fuel gas only
    - gas compression

Shell's Platform - EUREKA

- for the Beta Field (OSC-P301) in 700' of water
- jacket to be onsite in July, 1984
- development drilling to start in early 1985
- topsides design primarily by Shell Oil Company, Houston
- installation and facilities piping by Shell Southern California Development Group
- topsides fabrication by McDermott, Morgan city, Louisiana
- jacket fabrication by Kaiser, Vallejo, California
- drilling to be done by Shell personnel
- one rig to be removed from Platform Ellen in July, 1984, modified by Linder and Associates of New Orleans and placed on Eureka
- to produce to platform Elly via a 6" gas line and 12" oil line, each 2 1/2 miles long. Two power cables and a 10" water line come from Elly to Eureka
- produced water used for waterflood
- production facilities on Eureka (this is not a sour field)
  - oil/free water/gas separation
  - test separation
- production facilities on Elly:
  - oil treatment
  - gas dehydration
  - gas compression
  - water treatment

Texaco's Platform - HARVEST

- for the Pt. Arguello Field (OCS-P0315) in 670' of water
- to be installed in June 1985
- drilling to begin in October 1985
- first production in early 1986
- topsides design by Brown and Root
- jacket design by Brown and Root
- topsides fabrication by Hyundai Heavy Industries - S. Korea (underway) jacket fabrication by Daewoo Shipbuilding and Heavy Machinery - S. Korea
- drilling contractor is Hellmerich and Payne of Tulsa, Okla.
- two new rigs to be built and owned by H & P
- production to platform Hermosa (Chevron)
- production using gaslift until drilling complete, then use of extra electric power for submersible electric pumps
- gas reinjection capability to allow continued oil production in case of onshore facility shutdown
- purchasing handled through Houston office
- production equipment on Harvest:
    - gas/oil/free water separation
    - test separation
    - LACT unit
    - sulphur removal from gas for supply gas to turbine

Union's Platform - IRENE

- for the Pt. Pedernales Field (OCS-P0441) in 430' of water
- to be installed in mid 1985
- drilling to start in late 1985
- production to start early 1986
- structural topsides and jacket design by Brown and Root
- all process and drilling facilities by Union
- topsides fabrication by Hitachi
- jacket fabrication by Nippon
- drilling contract not yet awarded
  - Union to spec., purchase and build rig
  - independent contractor to operate
- Irene has capability to support two rigs - if second rig were added, it would likely be owned by a contractor. First rig likely to be converted to a workover rig
- production carried to Lompoc (landfall). One gas line, one emulsion line. Treated water returned to platform for dumping
- production by electric submersible pumps

4.5 Consumables

General comment on consumables is given under Section 2.6 as appropriate to Market Overview. However, given the variable nature of individual well requirements, it will suffice to indicate only the type of products consumed e.g.:

: Cement

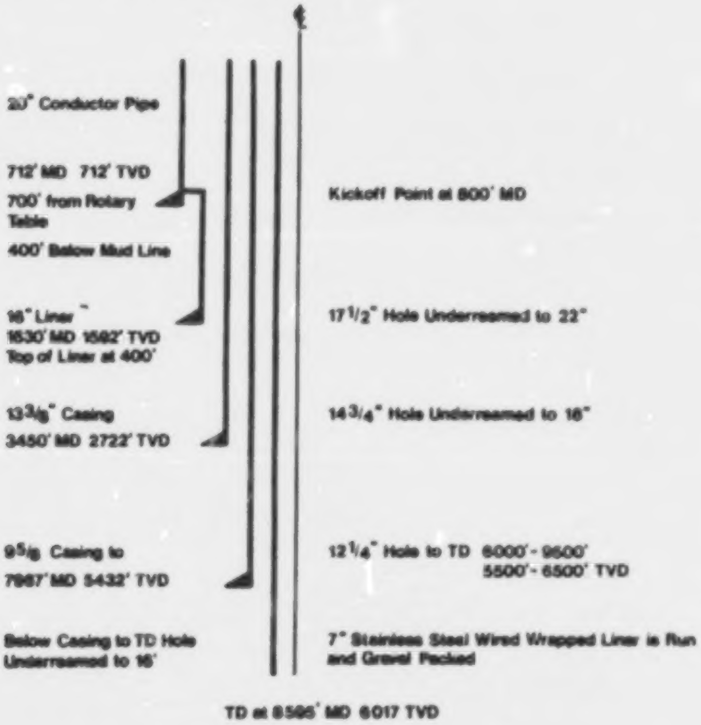
: Barite

: Drill Bits

For general guidance on casing/liners used in present offshore activities, Figures 4.1 and 4.2, annexed hereto, have been prepared for 3 typical offshore platforms.

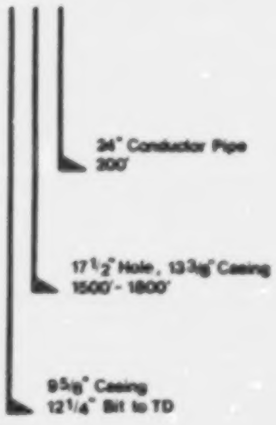
Figure 4.1

TYPICAL DRILLING PROGRAM FOR UNION'S PLATFORM GILDA



20" Conductor Pipe
712' MD 712' TVD
700' from Rotary Table
400' Below Mud Line
Kickoff Point at 800' MD
16" Liner
1630' MD 1592' TVD
Top of Liner at 400'
17 1/2" Hole Underreamed to 22"
13 3/8" Casing
3450' MD 2722' TVD
14 3/4" Hole Underreamed to 18"
9 5/8 Casing to
7967' MD 5432' TVD
12 1/4" Hole to TD 6000' - 9600'
5500' - 6500' TVD
Below Casing to TD Hole Underreamed to 16'
7" Stainless Steel Wired Wrapped Liner is Run and Gravel Packed
TD at 8595' MD 6017 TVD

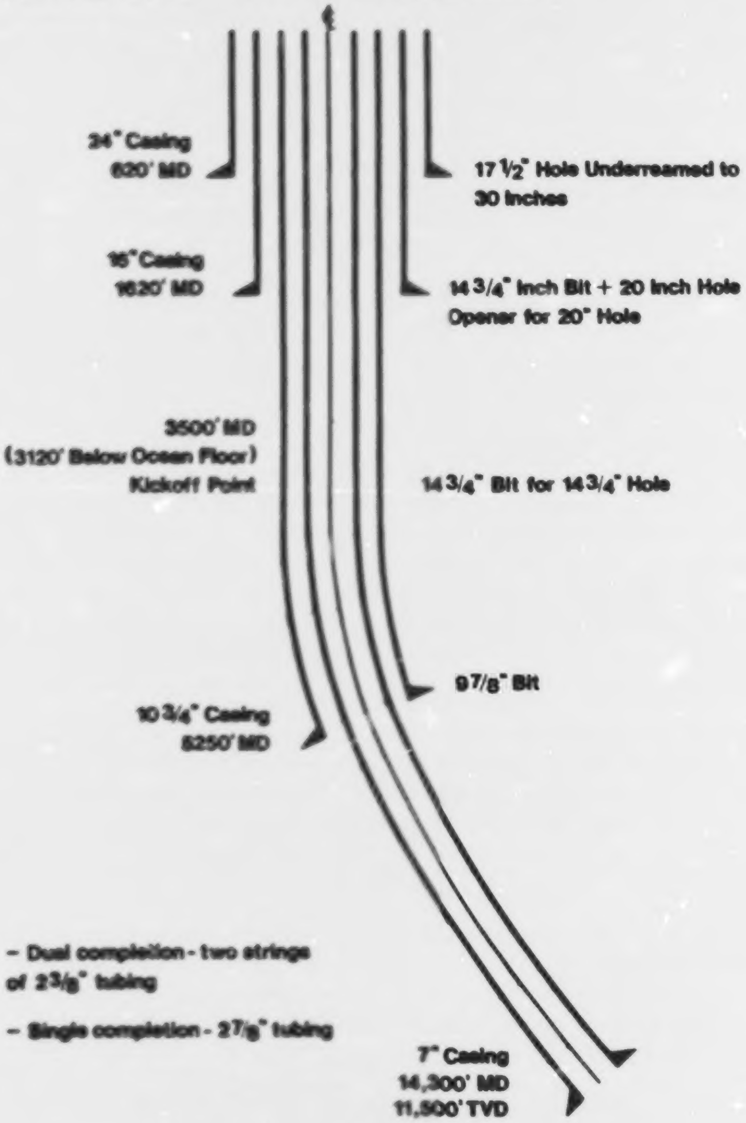
TYPICAL DRILLING PROGRAM FOR SHELL'S BETA FIELD PLATFORMS



24" Conductor Pipe
200'
17 1/2" Hole, 13 3/8" Casing
1500' - 1800'
9 5/8" Casing
12 1/4" Bit to TD

Figure 4.2

TYPICAL DRILLING PROGRAM FOR TEXACO'S PLATFORM HABITAT (Gas Production)


℄
24" Casing
620' MD
17 1/2" Hole Underreamed to
30 Inches
16" Casing
1620' MD
14 3/4" Inch Bit + 20 Inch Hole
Opener for 20" Hole
3500' MD
(3120' Below Ocean Floor)
Kickoff Point
14 3/4" Bit for 14 3/4" Hole
9 7/8" Bit
10 3/4" Casing
8250' MD
7" Casing
14,300' MD
11,500' TVD

- Dual completion - two strings of 2 3/8" tubing
- Single completion - 2 7/8" tubing

4.6 Standards and Regulations

(a) Mechanical Standards

In most cases, mechanical equipment manufactured in Canada is fabricated to meet American Petroleum Institute (API) standards and therefore poses no problems with acceptance by American purchasers. In favour of the Canadian equipment manufacturer is a reputation for rugged design which has evolved as a result of the more severe climatic conditions encountered in Canada.

The piping and pressure vessels associated with the above equipment are also manufactured in Canada to American standards. The American National Standards Institute (ANSI), the American Society for Mechanical Engineers (ASME) and the American Society for Testing and Materials (ASTM) are standards generally met by Canadian manufacturers. Consequently there is little concern for Canadian manufactured mechanical equipment meeting American requirements.

(b) Electrical Standards

There are several certification authorities in the U.S. for electrical equipment. Underwriters Laboratory International (U.L. or U.L.I.) is the most widely recognized organization followed by Factory Mutual (FM) who deal with more specialized explosion proof equipment. Other organizations such as Electrical Testing Laboratory (ETL) are relatively new by comparison but appear to be growing rapidly.

Because U.L. certification is readily accepted by most organizations, Canadian manufacturers should confirm with potential U.S. purchasers if this is a minimum requirement. However, it should be recognized that U.L. approval will increase the marketability of a product in California. The procedure to obtain U.L. approval is:

- write to U.L. requesting general information and table initial enquiry
- U.L. can send their standards for perusal prior to submission
- send detailed description of equipment to U.L.
- U.L. will provide a cost and time estimate for the testing and approval. This is typically $10,000 and 12 weeks
- send equipment for testing

- U.L. tests in their laboratory

It should be noted that the cost is for one test only and does not guarantee approval. U.L. will consider test results from C.S.A. although U.L. can be more stringent for explosion proof equipment.

U.L. has four testing laboratories in the U.S.A.: New York - New York, Tampa - Florida, Santa Clara - California and Northbrook - Illinois. The Northbrook office specializes in testing equipment destined for hazzardous locations.

The addresses and contacts of interest are:

Underwriters Laboratories
1655 Scott Boulevard
Santa Clara, California 95050

Client Advisor: Wanda Holland
(408) 985-2400

&

333 Pfingsten Road
Northbrook, Illinois 60062

Client Advisor: Al Bartkus
(312) 272-8800

(c) CSA Standards

It should be noted that results of a survey done by the Canadian Standards Association (CSA) involving 1200 inspectors in the U.S. indicated that CSA were the third most accepted electrical standard, close behind Factory Mutual.

The survey was carried out by CSA in 1983 using 1129 requests sent out to chief electrical inspectors for States and Counties throughout the U.S. Of the requests sent out, 466 were returned with 455 accepting U.L. and 197 accepting CSA standards.

Specifically to California, CSA sent out 207 requests of which 94 were returned. All 94 accepted U.L., 40 accepted CSA and 12 accepted any recognized authority giving a 55 percent CSA acceptance level for the State.

Most purchasers approached in California confirmed that they accepted CSA either specifically or as a generally recognized certification authority. One purchaser preferred U.L. whereas another commented that U.L. approval may need to be waived in some cases in view of the wide range of new products now on the market.

(d) Regulatory Authorities

The U.S. Department of the Interior - Minerals Management Services branch (M.M.S.) is the primary authority concerned with OCS exploration and development. The M.M.S. studies environmental impact, leases offshore tracts and ensures overall compliance with structural and code requirements. In addition the U.S. Coast Guard (USCG) monitors requirements for Mobile Offshore Drilling Units.

The M.M.S. does not recommend equipment or have "approved" equipment lists but has power of rejection on any equipment deemed unsafe.

M.M.S. procedures require that a Certified Verification Agent (CVA) be appointed to classify offshore vessels and verify structural and code compliance. There are a large number of CVA's in both Canada and the U.S.A. who are specially approved for such work.

Additional regulatory authorities sometimes involved in platform certification include:

: Environmental Protection Agency
: U.S. Army Corps. of Engineering
: U.S. Public Health Service
: Federal Aviation Administration
: Federal Communications Commission
: Federal Maritime Commission

5. EQUIPMENT PURCHASING CHANNELS AND METHODS

5.0 EQUIPMENT PURCHASING CHANNELS AND METHODS

5.1 Preamble

Equipment purchasing channels and methods vary depending on the type of equipment and the purchaser. In planning a marketing strategy, equipment should be considered in two broad categories:

- equipment required for platform fabrication and,
- equipment required after platform installation.

Aside from differing purchase procedures in these two groups , there is usually a very different time frame involved.

Equipment for platform fabrication is purchased within a limited time frame (usually one year) and for the most part can be considered a 'one time' purchase. Equipment purchased after installation (to be used for drilling or production) is purchased either over the life of the drilling program or the life of platform production. Since much of this equipment involves consumables or will require replacement due to wear, this sector will more likely involve repeat orders.

5.2 Purchasing for Platform Fabrication

In most cases, the design of a platform for offshore California is divided into three sections: the jacket, the topsides, and the derrick and drilling modules.

Derrick and Drilling Modules

The derrick and drilling modules are quite often designed, built and operated by an independent drilling contractor. After the drilling program is complete, the contractor removes his rig. The operating company may replace it with a lighter service rig immediately or may leave the platform without a rig and have one brought out as required for workovers. This relieves the operating company of the cost for drilling equipment that would rarely be used once the drilling program is complete. In this case, the rig equipment specification and purchase would be handled directly by the drilling contractor. His rig would be built to meet the operating company's performance requirements with only minimal input into purchasing decisions by the operating company. Most new rig construction is done out of Oklahoma or the Gulf States.

The amount of equipment purchased by the drilling contractor will depend on whether he is building a new rig or modifying an existing rig. An existing land rig can be modified for offshore use but it is usually more economical to build a new rig. The operating company will usually specify a new or 'like new' rig for a new platform. However, with recent low rig activity, re-building existing rigs may be more attractive now than before.

Alternatively, the operating company may determine that it is economical to purchase the drilling modules for operation by themselves or by an independent drilling contractor. This may be done when a further platform is planned. The drilling rig and facilities would then be moved from the first platform to the new platform upon completion of the first platform's drilling program. With increasing well depths, and the large electric submersible pumps and heavier tubing used for producing heavy crude offshore California, there may be an increased tendency to leave the heavier drilling derrick in place and convert it to a workover rig. This would likely induce the operator to purchase the derrick and drilling modules.

Typically, a consultant would carry out the design and purchasing function for drilling facilities to be owned by an operating company. In this case the consultant would prepare the equipment specifications and request quotations followed by technical and commercial review of vendor quotes. An operating company's technical and/or purchasing agent would be assigned to the consultant's office for input into equipment specifications and for final purchase approval. The consultant, on receipt of company approval, then purchases the equipment.

The bid list for equipment on a company owned rig is determined by several considerations. If the drilling contract has already been awarded, the drilling contractor will input any strong operational preferences. Major oil companies often have approved vendor lists for various types of equipment but these usually apply to refinery type equipment. It should be noted that consultants' recommendations from past experience often carry significant weight in determination of equipment bid lists.

Topsides Equipment

The topsides, as discussed here, exclude the drilling rig and support facilities discussed above. To varying degrees, oil companies will be involved in the detailed topsides design. In the case where a complete design is done by a consultant, the bid list, specifications, quotations and purchasing are handled in the consultant's office as described previously. Again, the company representative will give final purchase approval. A company's approved vendor list is more significant for much of this equipment as it is more closely related to refinery/process equipment.

Some operating companies do their own topsides design, including drilling facilities, in-house (i.e. Shell). In this case, there is no well defined purchasing structure. Design and purchasing will be done through the company project team with input from the regional drilling or production office in California. The project team may well be located in the company's Houston headquarters.

Equipment purchased by the consultant or company is forwarded to the fabrication yard for installation. The fabricator will be required to purchase many of the smaller bulk items required for installation of owner furnished equipment. These items would include instrument or hydraulic tubing, piping and valves smaller than 2" diameter, electrical wiring and conduit, nuts and bolts, various instruments etc. These items will be purchased by the fabricator at his expense but will be to company specifications.

Jacket

The jacket fabrication primarily involves the welding of structural steel with very little equipment installation. The steel purchasing is generally done by the fabricator in accordance with company design specifications. Only rarely, in instances where the schedule is extremely tight, would an oil company consider pre-purchase of steel. A considerable amount of steel is being supplied from outside the U.S. causing domestic suppliers great concern. The steel purchased is generally in the form of large diameter pipes with special nodes as separate items. The deck support structure is generally made up of rolled sections.

5.3 Purchasing After Platform Installation

Once the platform has been installed and commissioned, purchasing responsibility shifts from the consultant or company project team to the operational divisions in the oil company. Their concern is for equipment and supply purchases during the drilling and production phases.

Drilling

Most of the operating companies offshore California hire drilling contractors to do the drilling (Shell is a notable exception). A company drilling engineer on the platform will specify equipment required and forward these requirements to the appropriate departments onshore for purchase.

Purchasing would be done through the company drilling field offices or through their Western Region purchasing or production office. Service contracts for the drilling rig such as logging, cementing or for a directional drilling or mud engineer would be awarded through the field drilling office. Typically, a drilling program would last several years after platform installation depending on well characteristics and the number of rigs. During this period a constant flow of consumables is required. Commonly, drilling and production occur simultaneously as each well is completed.

Production

Production operations on a platform are not contracted out but are handled by oil company personnel. The amount of equipment purchased during the average 20 year production life of a platform drops significantly compared to the high level of purchasing required during fabrication and drilling.

Purchasing is done through the area production office. Since some West Coast operators remove the drilling rigs from the platform once drilling is completed, either drilling or workover rigs will be required on a short term basis on the platform. Depending on the type of downhole work required, either the drilling or production offices will contract this work.

Rental or Leasing of Equipment

Equipment which is used for a relatively short period of time such as cementing units, drilling chokes, logging units and some downhole tools are generally leased rather than sold to an operator. Some suppliers will not sell this type of equipment in the United States unless destined for foreign countries or international waters. This equipment must therefore be rented or leased.

The leasing of major drilling equipment would be done as part of the purchasing procedure for platform fabrication since it is a large piece of equipment and must be interfaced with drilling facilities. Smaller items such as downhole tools used during drilling or workovers would be rented by the drilling or production field office as required.

5.4 Purchasing Patterns

Equipment is purchased either directly from the manufacturer, from oilfield supply houses or from agents for specific lines of equipment. Discussions with purchasers and management in the operating companies indicates the following general trend in purchasing. Larger equipment is bought directly from the manufacturer where possible. If the manufacturer deals only through a distributor, or is well represented by a more conveniently located supplier, then direct purchase from the manufacturer is waived. The larger equipment typically comes from Oklahoma or Texas.

Oilfield supply houses provide much of the moderate and smaller sized equipment. Purchasing from agents tends toward more specialized equipment.

To assist the exporter in understanding the supply house system, set out below is a series of selected point form summaries of discussions held with supply house operators in California. These are supply house operators that indicated an interest in learning more about Canadian products.

Some supply house operators were opposed to carrying equipment from several manufacturers and carried only a single product line. They were therefore, not interested in Canadian products. Despite identification of the purpose of this study, some companies expressed reluctance to discuss their sales operation as they were suspicious that the enquiry was from a potential competitor. This was particularly so when general interest in oil industry equipment was stated as opposed to an interest in a particular piece of equipment.

The following sample includes both large and small suppy houses carrying a variety of equipment in different locations throughout California.

Exporters should also note that most supply houses of reasonable size maintain good archiving systems. These systems are such that once an organization is established therein, the supply houses themselves will keep coming back for repeat business on good products.

Contacting the supply houses would be a good approach for an exporter manufacturing a more general line of equipment. For specialized lines of equipment, not normally found in a supply house, these contacts may be able to direct the specialized manufacturer to an appropriate sales agent. A manufacturer of a particular line of equipment would also be well advised to consult the California yellow pages, available at most good libraries. The yellow pages for Ventura County, Kern County (Bakersfield), Los Angles County and Orange County would cover the major activity areas in California.

Republic Supply Company of California
20101 South Sante Fe Avenue
Compton, California

- discussion with Evan Pryde (213) 639-6350;
- handle valves, fittings, lubricants, tools, safety equipment, etc.
- not presently marketing any Canadian goods;
- 85% of equipment sold is from out of State, 70% of that from Texas, 30% from Oklahoma and Kansas;
- contact for Canadian manufacturers - President, Bill Coloruna
- most of their salesmen on straight salary;
- they provide no installation assistance;
- carry spare parts;
- equipment and spare parts in stock;
- no repair work done;
- 40 salesmen in California;
- 17 branch offices, 3 out of state;
- no import department but interested in Canadian goods;
- margin - up to 25% for stocked items
      - 5% for non-stocked items;
- margin dependent on size; and
- require manufacturer to deliver equipment to their warehouse.

Superior Supply
417 Walts Drive
Bakersfield, California

- conversation with Larry McGhee, Store Manager (805) 589-5150;
- contact for Canadian manufacturers - Don Nelson 1-800-551-8128 in Shreveport, Louisiana;
- carry pipe, valves, fittings, stuffing boxes, drill rig components, etc.
- overstock of material, therefore as low as 2% margin;
- commented that mill closings in U.S. over recent years due to pollution restrictions had boosted the import industry for steel products - mostly from Japan;
- believes California to be most competitive of all States;
- commented on smaller supply companies being able to provide better customer service than larger companies; and
- carry some spare parts.

E E Embury Inc.
19521 Garfield Avenue
Paramount, California

- Canadian manufacturers should contact Phil or Ed Embury (213) 634-5710;
- carry workover and production equipment e.g. tubing strippers, chemical pumps;
- 2 offices - Bakersfield and Paramount (near Long Beach);
- 3 salesmen, on salary;
- 20% margin for equipment in stock; and
- do sales, service and repair.

K-2 Supply and Rental Co.
191 West Stanley Ave.
Ventura, California

- discussion with Dave Meador (805) 653-1109, also contact for Canadian manufacturer;
- handle pipe handling and rig equipment;
- 3 offices, Long Beach, Bakersfield and Brawley (near San Diego);
- stock some equipment;
- average margin 10%, up to 30% for smaller equipment;
- commented on one major supply company going out of business in Ventura but attributed it to lack of effort of large supply house as opposed to smaller one.

Southern California Oil Tool Co.
P.O. Box 30
Bell, California 90201

- conversation with Arnold Smith (213) 560-1794;
- primarily involved in manufacture and supply of gaskets for refinery operation with salesman familiar with southern California refineries;
- plans for sales of other refinery related equipment;
- have warehousing facilities;
- margin of at least 15% for warehoused equipment; and
- commented that business presently slow in general - peak time is in Spring.

Mid-Continent Supply Co.
Gibson and Rosedal Hwy.
Bakersfield, California

- discussion with Pacific Area Mgr., Jack Duke (805) 827-7728;
- representatives for almost 500 manufacturers of drilling and production equipment;
- carry Canadian equipment, tubulars and sub-surface pumps;
- impressed with Canadian tubulars;
- provide installation assistance;
- carry spare parts;
- have some equipment in stock;
- no repair service;
- 6 salesmen, 3 branch offices, Bakersfield, Long Beach, Ventura;
- salesmen work on salary basis;
- equipment usually sent by truck;
- contact for Canadian manufacturer's, John Davio or Chris Kristopherson at (817) 335-4281; and
- no problems with sales or service with Canadian equipment.

Coast Petro-Chem
413 Dawson Dr.
Camarillo, California

- discussion with Bill Hickman (805) 484-1073;
- handle drilling and production equipment such as centralizers, scratchers, cement baskets, scrubbers, separaters etc.;
- contact for drilling equipment is Bill Hickman and for production equipment is Jack Burns;
- expressed interest in Canadian mechanical cementing aids and float equipment;
- have 1 office, 40 miles north of L.A.; and
- 4 salesmen.

As a general guide on purchasing patterns, the adjoining Figures 5.1 and 5.2 demonstrate the basic procedures normally adopted on purchases for platform fabrication and installation.

As stated in Section 3, owing to the vast number of manufactured items involved in fabrication and operation of a multi-million dollar offshore drilling and production platform, it is not possible, within the scope of this report, to direct equipment manufacturers towards an optimum market approach. However, equipment can be divided into general categories as listed below and as per Appendix I, but it is not possible to define a particular market approach that would apply to each category.

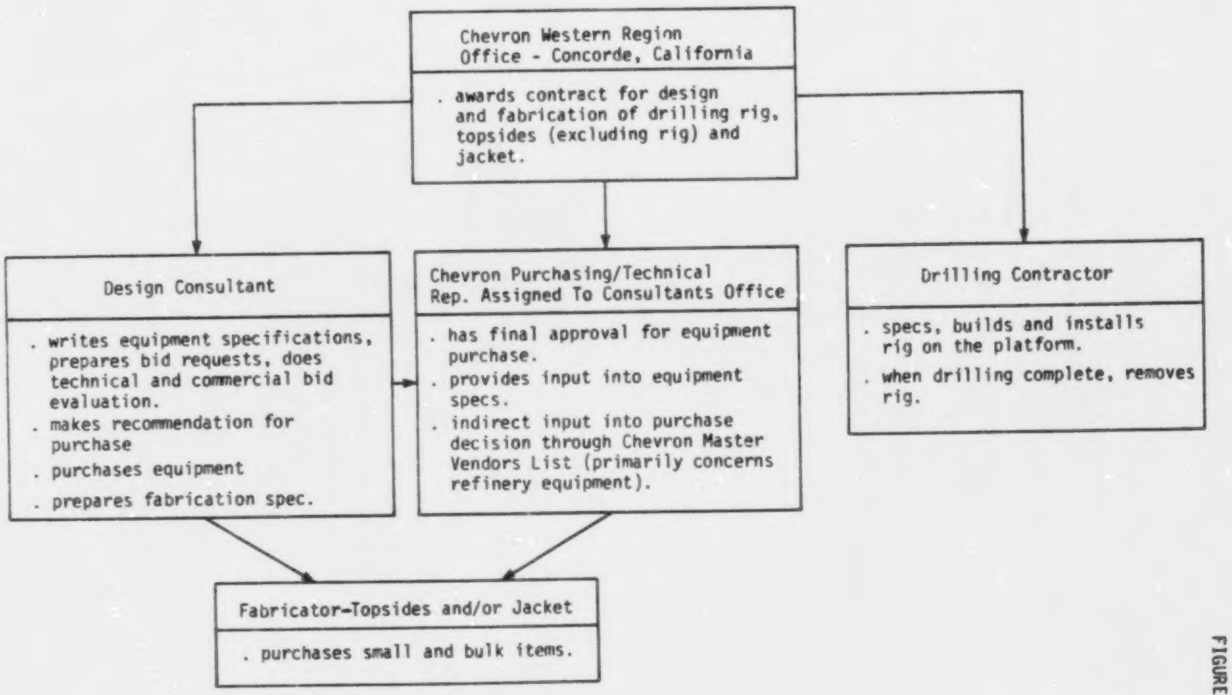
A summary of potential U.S. purchasers is as follows:

OIL COMPANIES - division purchasing office
- regional drilling office
- regional production office
- purchasing agent assigned to design consultants office

SERVICE COMPANIES - logging
- cementing
- directional drilling
- mud engineering
- wirelining
- fabricators
- design consultants
- drilling contractors

The supply houses, agents and oil company offices listed in this section, Section 3 and Appendix 'L' of this report will provide initial contacts for equipment marketing. Reference to Section 8 should also be made for guidance on Marketing Strategies.

TYPICAL PURCHASING PATTERN FOR PLATFORM CONSTRUCTION



Chevron Western Region Office - Concorde, California

- awards contract for design and fabrication of drilling rig, topsides (excluding rig) and jacket.

Design Consultant

- writes equipment specifications, prepares bid requests, does technical and commercial bid evaluation.
- makes recommendation for purchase
- purchases equipment
- prepares fabrication spec.

Chevron Purchasing/Technical Rep. Assigned To Consultants Office

- has final approval for equipment purchase.
- provides input into equipment specs.
- indirect input into purchase decision through Chevron Master Vendors List (primarily concerns refinery equipment).

Drilling Contractor

- specs, builds and installs rig on the platform.
- when drilling complete, removes rig.

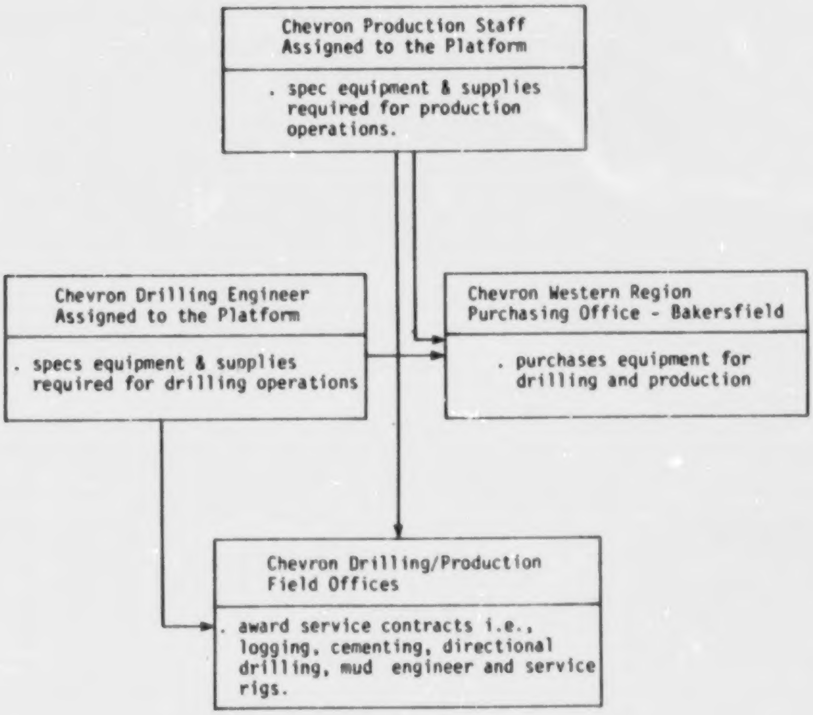
Fabricator–Topsides and/or Jacket

- purchases small and bulk items.

FIGURE 5.1

FIGURE 5.2

TYPICAL PURCHASING PATTERN AFTER PLATFORM INSTALLATION


Chevron Production Staff Assigned to the Platform
. spec equipment & supplies required for production operations.
Chevron Drilling Engineer Assigned to the Platform
. specs equipment & supplies required for drilling operations
Chevron Western Region Purchasing Office - Bakersfield
. purchases equipment for drilling and production
Chevron Drilling/Production Field Offices
. award service contracts i.e., logging, cementing, directional drilling, mud engineer and service rigs.

6. CALIFORNIA MARKET

6.0 CALIFORNIA MARKET

6.1 Preamble

In assessing penetration by Canadian manufacturers into the oilfield equipment market in California, several discussions with purchasers, engineering managers, drilling contractors and supply houses were held. Familiarity with Canadian equipment, reputation of Canadian quality and service and concerns with purchasing Canadian equipment were addressed. Canadian manufacturers currently marketing in California were approached with a view to identifying problems and solutions for the Canadian manufacturer attempting to market in the U.S.

For general information, statistical data on the value of imports of oilfield and drilling equipment into the U.S. together with a review of manufacturing currently undertaken in California is presented in this section. Source data was obtained from the U.S. Customs and the U.S. Department of Commerce comprising:-

: U.S. Bureau of the Census
: U.S. Industrial Outlook
: Department of County Business Patterns

The U.S. Bureau of the Census carries out comprehensive surveys of U.S. industrial and business activities every five years, covering years ending in "2" and "7". Of interest to this study is the Census of Manufactures for Construction, Mining and Materials Handling Machinery and Equipment which is one of a series of 82 industry reports providing statistics for groups of related industries. This group covers SIC (Standard Industrial Classification) 3531, 2,3,4,5,6, and 7 with SIC 3533 being the classification for oilfield machinery.

The oilfield machinery commodity expert for the U.S. Industrial Outlook department analyses statistics from the Census Bureau and forecasts trends for the next five years over the whole of the United States rather than by State.

The department of County Business Patterns was also contacted for a breakdown of manufacturing statistics as applicable to each county in California.

6.2 Imports Into The U.S.A.

Table 6.1 shows the value of selected pieces of drilling equipment imported into the United States in 1983. The total dollar value of U.S. imports is given followed by a breakdown of leading exporting countries.

Table 6.2 demonstrates the changes in Canadian market share of three main categories of oil industry equipment from 1980 to 1983.

It should be noted that the information in these tables is limited insofar as records kept at U.S. ports of entry permit. It cannot be determined as to how much of this equipment is destined for use in the offshore California market or the Gulf of Mexico or any onshore operation. To simplify tariff classifications, end use of equipment is not specified. Therefore equipment such as pumps, valves, compressors, engines, motors, heat exchangers, cranes, hoists etc., etc., are not identified as being destined for oilfield use when shipped separately over the border. When imported as an installed part of a rig, they would be included under the category for rigs.

Consequently, the figures in Table 6.1 give only limited indication of Canada's competitiveness with other countries wishing to enter the U.S. market. In fact, the first two categories in that table - Rock Drill Bits, Core Bits and Reamers, and Drilling and Boring Machines, are the two categories used as indicators by the oilfield industry specialist in the U.S. Dept. of Commerce to appraise the trends in oilfield equipment importing. They appear therefore to be the best indicators available.

Table 6.3 is presented as a better indication of Canadian exporting trends. Most categories indicate an increase in values of goods exported in each successive year. This peaked in 1981-1982 with a lower export value in 1983 (note: these values are in dollars current for the year specified i.e. inflation is not accounted for).

The percentage of Canadian exports going into the U.S. demonstrates the importance of the U.S. to the Canadian oilfield equipment exporting industry. To put these figures in perspective with regard to the U.S. importing of oilfield equipment, the 1983 Census Bureau figures were discussed with the U.S. Department of Commerce.

The oilfield equipment industry specialist estimates a product shipment value in SIC 3533 of $6,600 million in 1983. In 1983, $3,044 million of American manufactured oilfield equipment was exported from the U.S. Imports were $23 million. These figures show that in 1983 only 46 percent of the equipment manufactured in the U.S. was consumed in the U.S.; 54% being exported.

The apparent consumption of oilfield equipment in the U.S. is:

	$6,600	million manufactured in the U.S. in 1983
+	$ 23	million imported into the U.S. in 1983
-	$3,044	million exported from the U.S. in 1983

	$3,579	million apparent consumption in the U.S. in 1983

The $23 million of oilfield equipment imported from all countries into the U.S. represents 0.6 percent of the American consumption. These figures clearly indicate the huge market potential in the United States. Although breaking into this market will require serious efforts by Canadian manufacturers, the potential returns are substantial.

TSUSA CLASSIFICATION	COMMODITY GROUPING	TOTAL U.S. IMPORTS (MILLION $)	LEADING COUNTRIES EXPORTING TO U.S. AND VALUE (MILLION $)	
6494935	Rock Drill Bits, Core Bits and Reamers	7.215	Belgium	1.757
			Canada	1.137
			U.K.	1.142
6640810	Drilling or Boring Machine	16.237	Canada	8.383
			Finland	1.594
			U.K.	1.328
6529700	Offshore Oil and Gas Drilling and Production Platforms	11.143	Japan	10.903
			U.K.	0.194
			Other	0.046
6619500	Filter & Purifying Parts (would include desilters and desanders)	113.897	Canada	24.076
			W. Germany	17.435
			Japan	16.083
			U.K.	11.721
6802720	Safety & Relief Valves (including BOPs)	13.117	W. Germany	3.594
			France	3.128
			Japan	2.015
			Canada	0.908

SOURCE: U.S. Bureau of the Census

TABLE 6.1

IMPORTS INTO THE U.S. IN 1983 OF SELECTED

OILFIELD AND DRILLING EQUIPMENT

TSUSA CLASSIFICATION	1983 TOTAL	1983 CDN	1983 % CDN	1982 TOTAL	1982 CDN	1982 % CDN	1981 TOTAL	1981 CDN	1981 % CDN	1980 TOTAL	1980 CDN	1980 % CDN
6494935 Rock Drill Bits, Core Bits & Reamers	7215	1137	15.8	6385	1296	20.3	9442	3458	36.6	4923	3517	71.4
6640810 Drilling and Boring Machine	16237	8383	51.6	5809	4958	85.4	261628	20286	7.8	32847	4703	14.3
6529700 Offshore Oil & Gas Drilling & Production Platforms	11142	0	0	2280	447	19.6	16431	0	0	624	80	12.8

SOURCE: U.S. Industrial Outlook
CURRENCY: U.S. '000 Dollars

TABLE 6.2

Comparison of Canadian vs. Total Imports into U.S.A.

Description and Export Commodity Code	1983 Total	1983 U.S.	1982 Total	1982 U.S.	1981 Total	1981 U.S.	1980 Total	1980 U.S.	1979 Total	1979 U.S.	1978 Total	1978 U.S.
Core Drills, Core Drill Bits & Parts 52101	4700	2518 54%	11370	4085 36%	10025	3663 37%	7708	3011 39%	7476	4292 57%	6887	3031 44%
Rock Drills & Parts NES 52104	19700	13100 67%	31446	16940 54%	38163	18899 50%	31967	17371 54%	26481	18434 70%	23124	13750 59%
Rock Drill Bits NES 52119	7400	3300 45%	14336	9060 63%	8075	3600 45%	5752	2333 41%	3355	2237 67%	2393	1056 44%
Earth Drilling & Related Machinery & Parts 52119	14090	28200 20%	210896	116409 55%	355703	289595 81%	94877	71560 75%	45700	30312 66%	54627	44844 82%
Petroleum, Coal and Gas Producing Machinery and Parts 52190	45500	18000 40%	114796	57655 50%	112093	88612 79%	33855	19564 58%	30693	10684 35%	19184	10075 53%
Drilling Rigs and Equipment (Unsold) 99410	14770	366 -	295813	495 -	175380	28 -	N/R		N/R		N/R	

SOURCE: Statistics Canada

Dollar values shown are in '000 of Canadian dollars for the year specified unadjusted for inflation.

N/R - not recorded for those years
NES - not elsewhere specified.

TABLE 6.3

Canadian Exports of Oilfield Equipment

Worldwide and to the U.S.A.

6.3 Discussions with U.S. Purchasers

It appears that overall awareness of Canadian products in the California offshore industry is very limited. Most engineering managers were unable to name any equipment manufactured in Canada or identify any purchased by their company. Those directly responsible for purchasing had a greater awareness of Canadian products although most could not name any particular Canadian product. One purchaser stated that he was not aware of having purchased Canadian manufactured equipment, since they usually dealt directly with local distributors or supply houses.

Despite the limited knowledge of Canadian products, there was no one that considered Canadian equipment to be of poor quality and reputation. Some expressed concern for after sales service and parts but without having had any bad experiences.

6.4 Discussions with Canadian Exporters

Existing Canadian exporters were contacted to determine likely American response to the supply of Canadian drilling equipment and technology. The responses ranged from full acceptance to a hesitancy due to a "buy American" feeling. The existence of an "old boy" network did not arise in any discussion, since this would not be immediately apparent to outsiders anyway. It must be recognised that acceptance of Canadian products will only come with quality, dependability, back up service and, of course, with time.

The degree of Canadian representation in the U.S. varied between exporters from a single part-time agent to full-time personnel and supply capabilities. Generally, all manufacturers considered a part-time agent would be the most economical.

All Canadian exporters said that their main competition was American and generally from outside of California. In cases where the competition was established in California, the need for a strong continuous presence was preferable to part-time agents in order to compete. Consideration should also be given to group representation on a full time basis if conflicting interests can be avoided.

All Canadian exporters felt that they were successful in their venture into the California market but some cautioned that it was an expensive and time consuming exercise to get established. However, it appeared that, once established, orders were relatively steady.

The Canadian export companies found little difficulty with U.S. Customs, only that shipments of goods were slightly delayed. However, a three day delivery time via air freight for small packages was common and usually acceptable to purchasers.

For marine transportation, the Jones Act may apply, which limits the ability of foreign-flagged vessels (Canadian included) to carry cargo between two U.S. ports. For instance, the Act would prohibit Canadian vessels or barges from carrying a product from the Gulf Coast to offshore California. For guidance to potential exporters, the Jones Act is considered to affect the following oil and gas industry related marine equipment:

1. Tankers
2. L.N.G. Carriers
3. L.P.G. Carriers
4. Integrated tug barge units for transport of No. 1, 2, & 3 above.
5. General Cargo Vessels
6. Heavy Lift Vessels
7. Dry Tow Vessels (Self Propelled)
8. Special Light to Medium Vessels
    - A. Swath
    - B. A.C.V.
    - C. Hydrofoil
    - D. S.E.S.
9. Tugs
    - A. Port Tug
    - B. Dredge Assist Tug
    - C. Hopper Barge Handler Tug
10. Barges
    - A. Deck
    - B. Tank
    - C. Combination
    - D. Bottom Dump Hopper

6.5 Census of Manufactures

The most recent Census of Manufactures was completed for year ending 1982. The task in gathering, interpreting and publishing these statistics is such that the Preliminary Report for SIC 3533, Oilfield Machinery, was not released until late July, 1984 at the closing stages of this study. Statistics referenced are from this Preliminary Report and are not expected to change significantly from the final report to be published in February 1985.

In the 1982 Census of Manufactures, Industry 3533, Oilfield Machinery, recorded employment of 99.2 thousand. The total value of shipments for establishments classified in this industry was $11,218 million.

Statistical tables from the Census of Manufactures for SIC 3533, are included in Appendix H. Dollar figures indicated in these tables are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, the effect of inflation should be taken into account when making comparisons to previous years.

As a brief explanation of the Census product code system, SIC product code 3533 - Oilfield Machinery is clarified further as follows. The 35 specifies machinery except electrical (36 is electrical machinery). The 33 following the 35 defines oilfield equipment (32 is construction machinery and 31 is mining machinery). The full SIC product code is a seven digit number where further digits after 3533 define equipment. Product code 35333 defines oilfield and gas field production machinery and equipment except pumps. Product code 3533312 defines Christmas tree assemblies, excluding subsea. Tables 3 and 4 in Appendix 'H' use 6 or 7 digit SIC product codes. Table 3 compares the value of product shipments between 1982 and 1977. Table 4 compares materials consumed by the oilfield machinery manufacturing industry e.g. valves, hydraulic power components, steel bars and plate, motors, generators, etc.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and also have some miscellaneous receipts such as resales and contract receipts. In 1982 prices, industry 3533 shipped $9,284 million of products primary to the industry, $855 million of secondary products, and had $1,079 million miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 92 percent (specialization ratio). In 1977, this specialization ratio was 88 percent. This demonstrates an increasing trend toward specialization in an already highly specialized industry.

Establishments in this industry also accounted for 98 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 95 percent. The products primary to industry 3533, no matter in what industry they were produced, appear in Table 3 and aggregate to $9,498 million in 1982 prices. Increasing specialization will also have had effect on the increased coverage ratio between 1977 & 82.

Following the Census Bureau tables in Appendix 'H' is an explanation of the terms used by the Bureau. The Canadian exporter interested in further details is advised to obtain the final report available early in 1985. It will be contained in Volume II, Industry Statistics, 1982 Census of Manufactures. The particular document number is MC82-I-35B titled Construction, Mining and Materials Handing Machinery and Equipment and is available through the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402, or any U.S. Department of Commerce district office.

The 1982 Census oilfield equipment manufacturing employment figure of 99.2 thousand is 69 percent higher than the 58.6 thousand reported in 1977. The leading States for employment in 1982 were Texas, California, Oklahoma and Louisana. These four states accounted for 91 percent of the industry's employment. In 1977, the leading States in employment were Texas, California, Oklahoma and Pennsylvania accounting for 93 percent of the industry's employment.

The historical statistics in Table 1 of Appendix 'H' give an indication of growth in the industry in various terms. In this table, the increase in number of companies, number of employees, value added by manufacture, value of shipments and capital expenditures can be seen, noting that dollar values are for the year specified as mentioned earlier.

The Preliminary Census Report does not indicate the decline in growth over 1982. Although figures are not yet released, discussions with the Census Bureau indicated a definite decline in growth between the first and fourth quarters of 1982. Quarterly information will be available in detail upon release of the final Census Report early in 1985.

Unofficial information from the oilfield equipment industry specialist with the U.S. Dept. of Commerce estimates the value of shipments in 1983 to be $8.7 billion; a decrease of over 22 percent from the 1982 value of $11.218 billion.

The Department of Commerce industry specialist also commented on the surplus of equipment currently existing in the U.S.
Equipment is being sold at cost or slightly above cost in efforts to maintain cash flow by retailers.

However, an increase in oilfield equipment manufacturing in the U.S. is anticipated over the next few years. The U.S. Industrial Outlook projects a 4 percent yearly increase (compounded) in oilfield equipment manufacture each year for the next five years.

Further encouragement can be drawn from the level of drilling rig activity in the U.S. As of the August 6, 1984 - Hughes rig count, there were 2,417 rigs operating in the U.S. (102 in California - 14 of these offshore). This is an increase over the 2,140 rigs operating at the same time in 1983. Although this count still leaves approximately 30% of the rigs in the U.S. idle, there is an anticipated 11-12 percent increase in rig activity for 1984.

Table 2 in Appendix 'H' serves to detail how the Oilfield Machinery Industry stands in California with respect to other States in the U.S. The leading four States in oilfield equipment manufacture are Texas, Oklahoma, Louisiana and California in order of descending number of manufacturing establishments. They have 535, 131, 84, and 73 manufacturing establishments respectively. In all other statistical categories however, most importantly in value of shipments and employment, California is second only to

Texas and followed by Louisiana and Oklahoma.

To provide some indication of relative growth rates of the industry between the four leading States, the ratio of value of shipments between the 1982 and 1977 Census figures was compared. Louisiana led, increasing value of shipments by a factor of 3.88, from $94.6 million in 1977 to $367.3 million in 1982.

California came second with an increase of 3.21 times from $497.2 million in 1977 to $1,595.2 million in 1982. Texas followed with a factor of 2.81, from $2,659.5 million in 1977 to $7,462.4 million in 1982. Close behind was Oklahoma with an increase of 2.80, from $341.9 million in 1977 to $956.6 million in 1982.

Although not the leader in terms of growth rate, California has been in the forefront of expansion in oilfield equipment manufacture. This can be largely attributed to the activity offshore California; activity which is expected to continue well into the next decade.

6.6 Manufacturing Establishments in California

To provide data on existing establishments manufacturing oilfield equipment within the State of California, the County Business Patterns department within the U.S. Department of Commerce was contacted with a view to obtaining information regarding manufacturing concentration, size of establishment and employment within the States. Much of this information, however, was taken from Table 2 of the Preliminary Census of Manufactures since County Business Patterns uses Census information in their report. Given the recent release of 1982 Preliminary Census data, this report will not be ready until mid Septembr 1984; 1981 information being the latest available from County Business Patterns.

In 1981, there were 53 establishments classified under SIC product code 3533. These employed 10,672 people. These increased by 38 percent to 73 establishments and by 18 percent to 12,600 employees in 1982. Of the 53 oilfield equipment manufacturers in 1981, 33 of these were located in Los Angeles County, nine in Kern County and four in Orange County with others scattered throughout California. Although later statistics are not available, it is likely that industry growth would continue to be centred around Los Angeles where well over half the manufacturing was located in 1981.

A review of the statistics in Table 2 of Appendix 'H' indicates that, although California has the least number of manufacturing establishments of the four major oilfield equipment manufacturing States, it has the second highest number of employees and the second highest value of shipments. These two facts combine to suggest larger, more automated factories in California than other leading States.

In addition, the ratio of value of shipments to number of employees is the highest of the four States, supporting the suggestion of relatively highly automated and efficient manufacturing plants. The 38 percent increase in manufacturing establishments when compared to the 18 percent increase in employment between 1981 and 1982, also suggests newer and more up-to-date equipment being used in newly established plants.

6.7 Summary of Response by Canadian Manufacturers

This has been condensed in schedule form and is presented under Appendix 'I'. The schedule gives listings of Canadian companies with general interest in the products identified plus some indication of present U.S.A. (California) trading activities.

Manufacturer responses have been grouped into the following broad categories which are repeated in this section for ease of reference.

Equipment Categories

1. Drilling equipment
2. Consulting services
3. Process/production equipment
4. Downhole tools, completion and workover equipment
5. Tubulars
6. Safety/environmental protection equipment
7. Electrical instrumentation and communication equipment
8. Drilling and production support equipment
9. Miscellaneous/platform support equipment

Summary of Responses

List Total Responses:	174
Total Canadian Owned Companies:	111
Total Canadian Owned Companies Trading U.S.A.:	60
Total Canadian Owned Companies Trading California:	11

7. PRICING

7.0 PRICING

7.1 Preamble

The purpose of this section is to provide guidance to potential exporters on costs to which they may be subject. In particular, this section addresses exchange rate, transportation, customs duties, brokerage costs, supply houses and miscellaneous costs and concludes by presenting a point form summary on Pricing Structure (Section 7.8).

7.2 Exchange Rates

Although continually fluctuating, the exchange rate has maintained present day levels since February 1982. Trading since February 1984 has shown the following average monthly exchange rates.

1984:	Feb.	1.25
	Mar.	1.27
	April	1.30
	May	1.28
	June	1.304

Present exchange rates should give Canadian manufacturers a competitive advantage over their American counterparts.

Some manufacturers may elect to deal with currency fluctuation exposure by forward buying in order to determine constituent price levels over a certain period.

7.3 Transportation

Since most of the equipment used in the offshore drilling and production industry in California comes from out of State, there is little concern by purchasers with having to transport equipment over long distances. Due to lower labour costs, platform jackets are often fabricated in Japan or Korea using equipment purchased and skid mounted in the U.S.

In the U.S., much of the drilling equipment manufacturing centres are around Houston and Tulsa having similar road distances to Los Angeles as Calgary. However, a purchaser may specify that equipment be quoted including transportation costs to a location out of State. This would occur if a drilling rig fabrication contract was awarded out of State in which case the purchaser would want the equipment forwarded directly to the fabrication yard. Some fabricators are located in mid-west U.S.A., which would put Canadian manufacturers at a slight disadvantage. This should be more than offset by other competitive advantages such as quality, reliability, currency exchange, delivery etc. In view of tight schedules at fabrication yards, good delivery times and dependable service are often welcomed as the more favourable aspects of a quote and should be emphasized anyway.

The transportation alternatives available to an exporter include road, rail and sea. Naturally, competitiveness of individual or combinations of transport is directly related to equipment size, weight, delivery and accessibility. Available options are therefore discussed in general terms leaving specifics to individual exporters.

(a) Road

Depending on equipment size, weight and urgency of delivery, trucking costs can vary greatly.

Common carriers are generally used. The cost for an enclosed truck from Calgary to Los Angeles is approximately $4,000.00 (Cdn.). This is for a load that can be contained within 8' wide x 8' high x 42' long trucks with an average weight of 46,000 lbs. If a manufacturer wishes to transport a load of only half this size, the cost can be split if the trucking company is given enough time (usually within a week) to find another half load to the same destination. The total cost remains the same for either full or partial loads.

For heavier and larger equipment, a heavy haulage trucking specialist would be required. A standard legal load, would also cost around $4,000.00 and require dimensions within 8'6" wide x 8' high (13' 6" from the ground, loaded) x 40' long. For larger or heavier loads than this, the costs become very dependent on the exact load to be carried. Some heavy haulage specialists can demonstrate substantial savings over common carriers' rates.

If the load is overheight (over 8'), a low bed truck is required having an approximate cost, Calgary to Los Angeles, of $5,000.00). If sufficiently overheight, special routing is required to ensure overhead clearances. A load of up to 10 feet wide is easily accommodated with an overheight load.

Costs increase significantly for loads wider than 10 feet. Regulations vary between Provinces and States but in Alberta, a load over 12'-6" wide requires one pilot car and a load wider than 14'-6" requires two pilot cars. In California one and two pilot cars are required for loads over 10 feet and 12 feet respectively whereas in Wyoming, loads can be up to 16' wide with no pilot car. Pilot cars can add a further $2,500 cost to the transportation charge from Calgary to L.A.

An extremely heavy load can double or triple the shipping cost. A 75,000 lb. drawworks would cost approximately $13,000 to transport to California and require a 9 axle truck.

A large part of the additional costs for oversize and overweight loads are due to permit costs and permit restrictions which vary between States. Restrictions on travel at night can make transportation cheaper in summer than winter due to longer daylight hours. Requirements for taking alternate routes for wide loads can add over 500 extra miles to a trip.

Another variable affecting trucking costs is the urgency of delivery to its California destination. There is the cost saving mentioned previously if the shipper with only part of a full load can allow the trucking company time to find the remainder of a load and therefore split the cost of a full truck. It is advisable for the manufacturer to give as much leeway in delivery schedule to the trucking company as possible, even with a full load. The $4,000.00 cost can be reduced by over 30 percent if the trucking company has time to arrange for backhauling (finding a return load from L.A. to Calgary).

A Canadian manufacturer could realize this substantial saving in transportation costs by arranging for backhauling by an independent trucker. In view of these potential savings, exporters are advised to obtain a good cross-section of quotes since backhauling different goods requires appropriate licensing; some carriers therefore having greater restraints than others. The smaller, independent truckers usually operate through brokers or freight consolidators.

The subject of term service and/or contract commitment was also raised with road carriers. In general, this was not received favourably with guaranteed truck availability at specified intervals being preferred.

Given a suitable form of export requirement, it may also be economic to consider establishment of a private carriage system or to consider extending an existing facility to deal with specific deliveries. Private carriage does provide much greater control over delivery schedules and could prove advantageous under some circumstances.

Another alternative is the services of the Los Angeles Machinery Distributor's Association. LAMD is a freight consolidating association (a non-profit organization) established to reduce freight costs on all types of machines. It can arrange transportation of machinery from any Canadian industrial centre to San Francisco, San Diego or Los Angeles. Membership is available to Canadian machinery manufacturers. Savings up to 25% on regular freight costs can be achieved.

(b) Rail

The cost of transporting equipment by rail is based on tariff rates published by the railway companies. These tariff rates are based on the commodity being shipped, the number of railway miles to transport and the weight of the equipment. The higher the total weight, the lower the cost per pound to ship.

As an example, the rate to ship a minimum 60,000 lb load from Edmonton to New Westminster, B.C., would be approximately $4.35 per hundred pounds. From New Westminster to Los Angeles would be $6.41 U.S. per hundred pounds. The cost for a 60,000 lb load would therefore be over $7,600 Cdn. Additionally, there are loading, unloading, blocking and bracing costs.

Railway transportation is generally more economic for very large and heavy loads. A flat car can carry up to 180,000 lbs. The standard flat car size is 52'-6" long x 10' wide with with 13' high load easily accommodated. Flat cars up to 89'-4" in length are also available but require scheduling for availability.

A complex system of tariff rates is required due to the various railway companies in operation. They permit standardized rates to apply where as many as five different railroad companies could be involved in transporting a load from Calgary to Los Angeles. The manufacturer is advised to contact either Canadian National or Canadian Pacific Railways for specific rates appropriate to their requirements.

(c) Sea

The kind of items transported by the oil and gas industry fall into the category of general (or break-bulk) cargo. These range in size from a small part to a large drilling rig. The transport of small items as break-bulk cargo (i.e. individually stowed into a ship) would be unusual today; such products now being generally containerized. Large items, however, are often carried as break-bulk cargo.

The availability of sea transport for cargo between Vancouver and the Los Angeles/Long Beach area was investigated. Although there is no shipping operation dedicated to this service, there are several lines that can provide such shipments; very little general cargo actually moves by this route. Small items would have to be containerized and the smallest lot size would generally be a single 20 feet container which can carry up to 20 tonnes or 30 cubic metres of cargo. On occasion, and by special arrangement, part container loads are available on a share basis. This could also involve delay since shipping could be held up if the "share" partner(s) cannot make a date.

Large items can be handled individually and several lines have transported drill rigs. All freight rates are negotiable with no set tariffs to California.

A representative, but incomplete, list of shipping services includes:

- North Pacific Shipping (represented by Westward Shipping) have a 16,000 DWT geared bulk carrier on a semi-scheduled service between Vancouver and California. Their principal cargo is lumber loaded at Seaboard International Terminal in North Vancouver, but they do carry other cargoes.

- Bluestar Line (represented by Interocean Shipping Company) have container ships that call at California ports on their way to New Zealand. They carry only containerized cargo and only full container loads. They call at Vanterm every 23 days.

- Johnson Scanstar (represented by Johnson Wolton) have full containerships on a service between Vancouver and Europe with stops in California. In addition to containers, they will carry large , individual items either on deck or stowed below on flat racks. They have transported drill rigs to Europe in this way and usually call at Vanterm every 10 days.

- Pacific Australia Direct Line (PAD) represented by Empire Shipping, has a regular ro-ro service via California to Australia. Although they generally do not load Vancouver cargo for California destinations, they will do so if volumes are sufficient. Their ro-ro vessels have stern ramps and internal clearances that can easily handle large individual cargo items. They have transported drill rigs to Australia and can provide a 2-3 week call frequency to Fraser-Surrey Docks on the main arm of the Fraser River.

None of the tug and barge operators provide a regular service for general cargo to California. For large, single shipment; however, arrangements could be made with a barge operator for delivery on a one-off basis.

The wide range of equipment required for an offshore production platform with potential suppliers across Canada should lead to many optimum solutions for equipment transportation. A manufacturer should thoroughly investigate alternatives before approaching purchasers in California.

7.4 Customs Duties

Drilling or oilfield equipment imported into the United States is subject to U.S. customs, laws and regulations. The type of equipment being imported will determine the tariff or duty rate that is applicable. These tariff rates are outlined in the Tariff Schedules of the United States (TSUS), a sample of which is given in Appendix 'K'.

In the TSUS, commodities are grouped in schedules which cover very broad categories. For example, Schedule 6 is Metals and Metal Products. These schedules are then divided into parts where Part 4, for example, covers Machinery and Mechanical Equipment. Further subdivision results in a five digit number which can be located in the tariff schedule to determine the duty rate.

Due to the wide variety of drilling and production equipment and related items exported, an exact listing of each duty rate that can be expected is precluded here. However, it can be anticipated that a U.S. Customs duty rate of between 3% and 9% will usually be applied based on the 'value' of the goods. The 'value' is generally defined as the transaction price between the Canadian seller and the U.S. purchaser.

Appendix 'K' provides a selected extract from 1984 Tariff Schedules of U.S.A. Typical examples taken from these Schedules are:

Item	Articles	Rate of Duty
652.9700	Offshore oil and natural gas drilling and production platforms and parts thereof	7.1%
660.9725	Reciprocating Pumps	3.8%
678.2010	Machinery for sorting, screening, separating, washing etc. (e.g. Shale shakers)	3.7%

Many parts of a drilling rig that would have other non-drilling related uses would be classified differently if imported separately. For this reason, it is important to determine beforehand, tariff classification and value of any product to be imported into the U.S. This, and other market entry information can be obtained from U.S. Customs, from a U.S. Customhouse broker or from the U.S.A. Marketing Division (U.T.M.) of the Department of External Affairs in Ottawa, (Phone No.: (613) 993-7484). Specialists in the U.S.A. Marketing Division can obtain official binding classification rulings from the U.S. Customs Service in Washington, D.C. or New York.

7.5 Customs and Customs Brokerage Fees

Canadian equipment purchased for use in the U.S. must be cleared through U.S. Customs. Shipments can be cleared either at a border port of entry or bonded-on to an interior port in the U.S. for later clearing. This clearing procedure can be done by the consignee, his authorized employees or his agent, i.e. a licenced U.S. Customhouse broker. It is advisable that a U.S. Customhouse broker be employed to facilitate customs clearance.

At the U.S. port of entry, the carrier should present the accompanying documentation to the specific broker named by the equipment manufacturer. Documentation generally consists of the commercial invoice and a bill of lading. The first-time Canadian exporter in particular should contact the U.S. Customhouse Broker, U.S. Customs or the U.S.A. Marketing Division (U.T.M.), Department of External Affairs, to ensure familiarity with regulations regarding documentation, marking requirements, payment of duty etc.

To ensure expeditious customs clearing and subsequent delivery to the purchaser, the manufacturer should carefully choose their customs broker and work closely with them to ensure all customs requirements are known and met. Appendix 'M' includes a letter outlining typical broker's fees and a list of customhouse brokers.

Brokers' costs can vary considerably depending on the initial relationship set up. Exporters are advised to discuss their program with several brokers and consider their options carefully before choosing.

7.6 Oilfield Supply Houses

Discussions with major oilfield houses in California indicated that they would be interested in learning more about Canadian equipment. Approximately 75% of the equipment carried by supply houses is manufactured outside California with some Canadian equipment currently being marketed.

In general, their salesmen work on a salary basis. Some provide installation assistance to the purchaser but none provide repair service. They all carry a limited amount of equipment in stock with some spare parts.

They indicated that their margin would range from 5% on equipment they did not have to stock, to 25% on items kept in stock. Due to the present oversupply of some equipment, Californian equipment suppliers are having to bid some equipment with very little profit margin. To establish their products in the Californian market, Canadian manufacturers may have to supply their equipment at discounted prices initially in preparation for the anticipated increase in activity. They all indicated that they would want equipment delivered to their warehouse.

Documentation requirements varied according to the types of equipment and purchaser. Requirements ranged from basic operating, maintenance and spare parts instructions to more extensive documentation such as mill test certificates, hydrostatic tests and actual performance curves for pumps. Requirements for the amount of documentation would be largely dependent on the purchasing company. For flexibility, comprehensive documentation should be provided.

Delivery times for equipment acceptable to operators vary depending on the item. With the surplus of equipment still available from the recent economic slowdown, there is more available in stock than ever before. Delivery times of 6 - 10 months are still accepted for larger equipment packages.

For additional guidance on oilfield supply houses, reference should also be made to Section 5.4 - Purchasing Patterns, Section 3 - Key Entities and Appendix 'L' - Industry Directories of this report.

7.7 Other Miscellaneous Costs

The following additional promotion related costs have also been identified to assist exporters in preparing their business plan.

(a) Travel and Accommodation

The return air fare cost from Calgary to Los angeles is Cdn$523.00 with hotel/motel accommodation varying but in the region of Cdn$60 per night.

(b) Advertising Rates

The study investigated three of the better known industry magazines with the following indicative rates being given:

- Oil & Gas Journal - Advertising Rates per page:
  : Black & White US$2,950 per page
  : Full colour, additional US$1,125
  : Single colour, additional US$275
- Mechanical Engineering - Advertising Rates per page:
  : Black & White US$2,640
  : Full colour, additional US$950
  : Single colour, additional US$330
- Offshore - Advertising Rates per page:
  : Black & White US$2,650
  : Full colour, additional US$975
  : Single colour, additional US$250

Rates for other trade magazines are available by contacing the addresses given in Section 8.3 of this report.

(c) Trade Shows

Section 8.3 gives the two remaining oil shows and conferences scheduled for the California area; the Bakersfield Show now being cancelled for 1984.

The Society of Petroleum Engineers were not able to give 1985 rates at this time but indicated that 1984 rates were US$6.50 per sq ft inside and US$3 per sq ft outside.

The Pacific Coast Oil Show & Conference rates for floor space would be made available in the near future.

7.8 Pricing Structure

Competitiveness in pricing becomes the major issue if quality can be demonstrated by proven use elsewhere backed by compliance with acceptable U.S. standards. After discussion with the several contributors to this study, the following major points of cost consideration emerged which are presented in point summary form for initial guidance in marketing oil industry products offshore southern California.

(a) Whenever possible, prices should be quoted inclusive of all duties, fees, commissions, delivery, etc.

(b) If freight is difficult to assess until a fabrication is completed, provide a freight estimate and arrange for separate invoicing.

(c) Currency exchange risk between U.S. and Canadian dollars may need to be addressed. As a matter of policy, prices should be quoted in U.S. dollars (Section 7.2).

(d) Fully investigate transportation options as substantial economies can be obtained; see point (j) below and Section 7.3.

(e) Obtain official binding classification rulings from the U.S. Customs service (Section 7.4).

(f) Consider brokers and brokerage fees carefully as these can vary widely (Section 7.5).

(g) Select suitable supply houses and determine handling margins for both stocked and non stocked items. Beware of artifical margins; see point (p) below and Section 7.6.

(h) Consider establishment, promotional and regular marketing expenses over a suitable period noting the anticipated growth for the region.

(i) Consider establishment, promotional and regular marketing expenses in association with a complimentary joint venture arrangement running a local marketing office.

(j) Consider savings in transportation costs by operating a complimentary joint venture private carrier service.

(k) Consider additional costs of communications and travel associated with operations in southern California.

In addition, some of the more subtle aspects of competitors pricing in the industry are also identified to assist exporters in arriving at an optimum approach.

(l) Cost of comparable products marketed by competitors.

(m) Consider initial discounting to gain access to the Californian market and therefore awareness of Canadian products.

(n) Serviceability and technological advantages over competitors' products (if any).

(o) Existing inventory levels and age of competitors' stock.

(p) Possible discounting structure in place on competitors' products to move inventory.

8. MARKETING STRATEGIES

8.0 MARKETING STRATEGY

8.1 Overall Strategy

In developing exports to the offshore Californian oil industry, manufacturers should first assemble a carefully considered business plan.

In general terms, such a plan would include selection or identification of a suitable opportunity (or opportunities) followed by deciding on a means of representation and subsequent approach to the market. The plan should be sufficiently flexible to adapt to changing industry needs and a continually improving knowledge of the marketplace.

Having established a place in the market, the plan should also include for adequate back-up service and spares to ensure continued development and consolidation within a highly competitive industry.

This study is intended to assist manufacturers in identification, awareness, development and consolidation of an offshore Californian market and in summary, the overall strategy should culminate in establishing a long term presence in which consumers have confidence.

The following sections are intended to itemize some of the finer points in developing a total marketing strategy.

8.2 Market Opportunities

In carrying out this market study, opportunity is presented for potential exporters to create a marketing strategy framework which will guide their actions and resources toward an effective export program.

In addition, the Program for Export Market Development (PEMD) has been designed to help Canadian corporations develop, increase and sustain their activities by sharing in the costs of specific marketing efforts.

PEMD is geared to:

: encourage businesses to begin export marketing.
: encourage established exporters to expand into new markets.

A copy of the External Affairs, Canada brochure on PEMD is included under Appendix 'N' for information. Complementing this Program is also Section S which provides financial assistance to non-profit organizations where there is a clearly defined link between the contribution and possible future Canadian export sales without, however, the requirement that there is a specific potential benefit from each contribution.

Traditionally, platforms for offshore California have cost about U.S. $800 to 900 million for operation in about 1000' of water. Historically, foreign companies usually make up 7 to 8 percent of this expenditure amounting to approximately U.S. $65 million per platform. It is currently planned to install 11 new platforms offshore over say the next 7 years, suggesting approximately U.S. $100 million per annum of foreign expenditure. This assumes no increase in effort by Canadian or foreign competition.

This figure also assumes the continued use of existing technology. If new technology is developed for or required by the offshore industry then the total picture could change. The ability of Canadian companies to either lead or quickly follow such changes could dictate the direction of change in favour of improved exports.

As mentioned in Section 6, there is room for a greater awareness of Canadian products and technology in the market place. Improved awareness and therefore market opportunity can be created by careful planning.

Study of Section 6.2 in this report will show total imports of oil industry product code SIC 3533 as 0.6 percent of U.S. domestic consumption for 1983. Given a 1983 U.S. domestic market consumption of $3,579 million, opportunity for export market development by Canadian firms is therefore excellent.

Given the nature of the low gravity, high sulphur crude product typical of the area, opportunity exists for further research and development on production and maintenance problems. In particular, this would apply to subsea technology given the increasing water depths now being contemplated. Canadian expertise in handling heavy crude products may prove advantageous in this field.

The nature of the Monterey formation presents problems with enhanced recovery techniques resulting in a general tendency to use submersible downhole pumps. Additional and innovative work on enhanced recovery techniques would be beneficial to the offshore California industry.

At the present predicted rate of platform installation with associated onshore activities, a relatively steady workload should be maintained. However, manufacturers with a particular expertise or a particular product is likely to experience peaks and troughs in demand. Good planning and market awareness would maximize opportunity to meet these demands.

Offshore work in California experienced an active period in the 1960's and a quiet period in the 1970's. Present trends suggest that the 80's will show a much increased activity level building to a peak in the early 90's. Exploration activity has peaked and plans for production platform installation are underway. Potential Canadian exporters should be making their entry or increasing their activity level in the market as soon as possible.

8.3 Promotional Methods

The main objective of any approach to a new market is to publicize the company name and the product(s). Trade shows, paper presentations and magazine advertising are generally considered the most favourable of promotional techniques.

In the California area, there are three main industry shows which attract most people with interests in the oil and gas business. These shows, whilst traditionally onshore, are now developing offshore sections with anticipated expansion in that field.

In order of industry significance, the following local shows would be of particular interest to an exporter of oil and gas equipment:

Society of Petroleum Engineers (S.P.E.)
S.P.E. Oil Show, March 27-29, 1985
Head Office - S.P.E.
6200 N. Central Expressway
P.O. Box 64706
Dallas, Texas, 75206
Regional Office - S.P.E.
c/o Getty Oil
P.O. Bin H
Taft, California 93268
Exhibit Chairman - Rik Williams (805) 765-4104

Pacific Coast Oil Show & Conference
Bakersfield, Ca., November 13-15, 1984
Organised by Petrotech Expos Ltd.
6 E. Monroe St.,
Suite 1204, Chicago
Illinois, 60603
President, Rob Kolinek (312) 346-2341

Bakersfield Oil Show - Now cancelled for 1984

Additionally, the Offshore Technology Conference (OTC) held annually in Houston, Texas covers a much wider spectrum of the offshore industry and should be seriously considered as part of any major promotion. This is the best attended of the shows and attracts most key people in the industry. Participation in OTC can range from simply attending to exhibiting with obvious cost differences.

Periodically, various professional associations such as the International Association of Drilling Contractors (IADC) will have local shows focusing on offshore California. Information on these can be obtained through professional organizations or trade publications such as Oil and Gas Journal which generally publish calendars of upcoming events.

It is always useful to place and maintain company name and product before the industry and in this manner, trade magazines are a useful tool. In addition to simple advertisements, the publishing of technical papers in these journals can be advantageous. This indicates a thinking, innovative approach to the industry sector of particular interest. However, this sort of promotion is largely directed to technical people who are in a position to make recommendations only on purchases. Purchasers must be aware of such recommendations so follow-ups to contact the actual purchasing groups as well as the technical personnel are very important.

Presentation of technical papers at trade conferences are normally welcomed and these often serve as an excellent means of acquainting key people with new technology, a service or a particular product.

Advertising in general obviously serves to improve awareness and promote the product or service in the market. Available vehicles for advertising include the following with indicative rates being given under Section 7.7.

- California Yellow Pages	(See Appendix 'L')
- Petroleum Industry Yellow Pages	(See Appendix 'L')
- Oil and Gas Journal	313 Freeway Center Bldg., 3605 Long Beach Blvd. Long Beach 90807 (213) 426-7008 Subscription - US$34 per year
- Mechanical Engineer	345 E. 47th St., New York, N.Y. 10017 (212) 705-7784 Subscription - US$12 per year
- Offshore	1200 Post Oak Blvd., Suite 106 Houston, Texas 77056 (713) 621-9720 Subscription - US$45 per year
- The Oil Daily	850, 3rd Ave. New York, N.Y. 10022 Subscription - US$327 per year
- World Oil	Gulf Publishing Co. 3301, Allan Parkway Houston, Texas 77019
- Petroleum Engineering International	P.O. Box 1589 Dallas, Texas, 75221/1589 Subscription - US$16 per year

- Ocean Industries	Gulf Publishing Co. 3301, Allen Parkway Houston, Texas 77019 Subscription - US$ 30 per year
- Journal of Petroleum Technology	Society of Petroleum Engineers P.O. 64706 Dallas, Texas 75206 Subscription - US$12 per year
- The Drilling Contractor	Adcraft Roy L. Markum/Bob Flowers 4740 Ingersoll Suite 103 Houston, Texas 77027 Subscription - US$40 per year

8.4 Approach

Any good marketing strategy must have ample capacity built in for improvisation as changing market conditions and field market work dictate. The following point by point outline should give exporters some guidance on development of an approach to marketing best suited to their needs.

- Mail literature to consultants, operating companies, drilling companies, supply houses, distributors etc. on a selective basis best suited to product or service requirements. Appendix 'L' - Industry Directories gives appropriate leads to allow advance planning. Sections 5.4 & 7.6 give a cross-section of Supply Houses and general information.

- Visit southern California and spend some time improving general awareness of the marketplace being considered.

- Establish contact with the Canadian Consulate in California and appraise relevant officers of your business plan. Maintain contact with the Consulate periodically who may be able to offer up-to-date information on certain issues.

  Address: Canadian Consulate General
  510, West Sixth Street
  Los Angeles
  California 90014 (213) 627-9511

- Contact end users who have expressed interest in a product. Maintain contact and develop.

- Spend some time thoroughly investigating the supply houses/distributors likely to be most suited to product or service needs. Individual supply houses vary substantially and options should be considered carefully. Maintain flexibility if needs arise. (Sections 5.4 & 7.6)

- Establish supply house/distributors preferred method of doing business in California. Obtain several comparisons.

- Be prepared to rent space in oil and gas industry shows. Be able to demonstrate good back-up sales and spare parts service.

- Address the question of freight in detail since the several options available present a wide variance in cost. Ensure scheduling of deliveries is fully determined since this may affect long term credibility. Quote fully delivered prices (Section 7.3).

- Determine tariff classification and product value. Obtain binding rulings from U.S. Customs Service (Section 7.4).

- Discuss export program with several customs brokers and consider options carefully before choosing a broker. Costs can vary considerably depending on the initial relationship (Section 7.5).

- Consider realistic budget for cost of establishing and maintaining a continuing marketing operation in California. Ensure funds for regular marketing, service and technical back-up are properly addressed.

- Consider allocating a fixed promotional budget to a supply house/distributor to develop advance awareness of a product(s).

- Consider initial discounting to establish entry to market. Be aware of discounts in place to assist in moving inventories given recent difficult economic times.

- Establish a good communication system which will allow users/supply houses ease of contact. Be prepared to respond quickly, efficiently and positively to any problem.

8.5 Representation

The point form suggestions of approach in 8.4 above, if considered carefully, should result in sales. However, the level of sales and potential for growth will likely remain in the hands of a supply house, consultant or corporation.

To increase sales of Canadian goods and services at a rate sufficient to improve market share, due care and consideration should be given to proper representation on an ongoing basis.

The following points of representation are noted for guidance and likey to contribute to a successful marketing strategy.

- Ensure good back-up service and spare parts availability. Be prepared to extend normal limits of co-operation if competition is to be beaten.

- Follow up on product serviceability with end user with intent of improving technology, anticipating problems and enhancing credibility.

- Frequent contacts with businessmen in the industry. Be careful of over-representation.

- Develop consultant contacts for ongoing technology and product awareness. This would keep technology and product development up front and allow some in-sight to developments by competitors.

- Ensure consumers are aware of a continuous and 'real' presence in the market that can be relied upon at any time both now and in the future.

Given the foregoing, it would appear that the most viable marketing concept would be for manufacturers to consider establishing a suitable marketing office in the southern California area from which regular marketing activities and continued representation can be organized.

Such a marketing office would carry out the functions of a regional distributor and technical advice centre whilst also providing an operating link with factories in Canada. It could be either individually or collectively established and would ensure an environment which would strengthen any export initiative.

Individual action along these lines may be neither practicable nor economic which suggests formation of a complementary joint venture arrangement. The presence of a California based marketing organization will undoubtedly enhance credibility and provide necessary assurance to the industry as a whole.

Assuming either an individual or joint venture marketing office to be viable, some of the advantages that can be realized are:

- Immediately available technical assistance.

- Monitor activities of selling organizations at first hand.

- Maintain better overall market awareness.

- Have the capacity to respond quickly to perceived changes in the market.

- Identify defaulting distributors quickly and move to minimize loss of credibility and sales.

- Respond quickly to faulty equipment.

- Potential reduction in transportation costs.

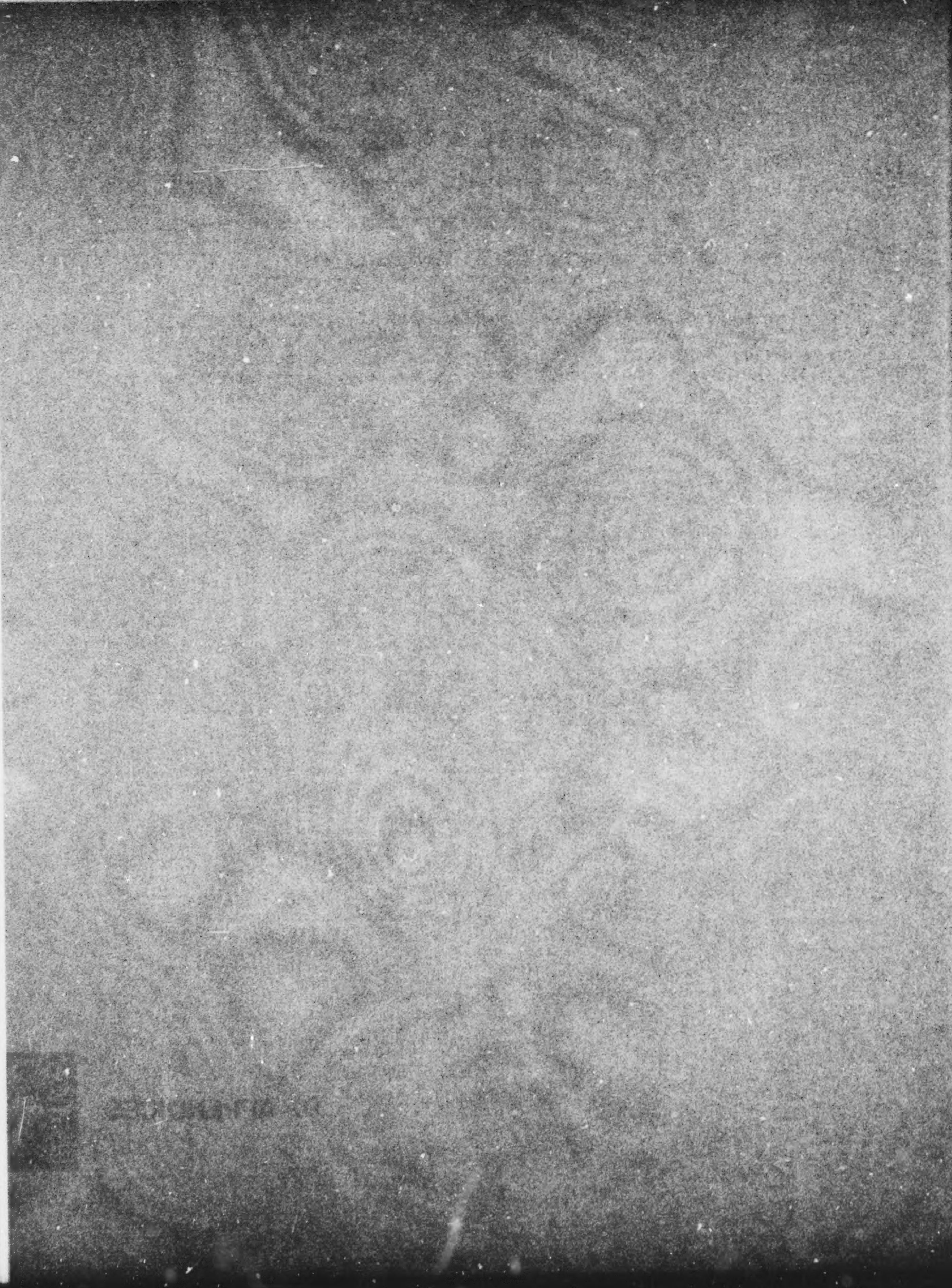
- Change brokers/agents/salesmen if necessary.

- Much enhanced credibility in the marketplace.

- Initiate selective/intensive marketing programs when needs arise.

In conclusion, it is considered that far more sales can be made over a given period if a marketing office can be established. Regarding the smaller manufacturer, it should be possible to formulate a joint venture given complementary product or service lines.

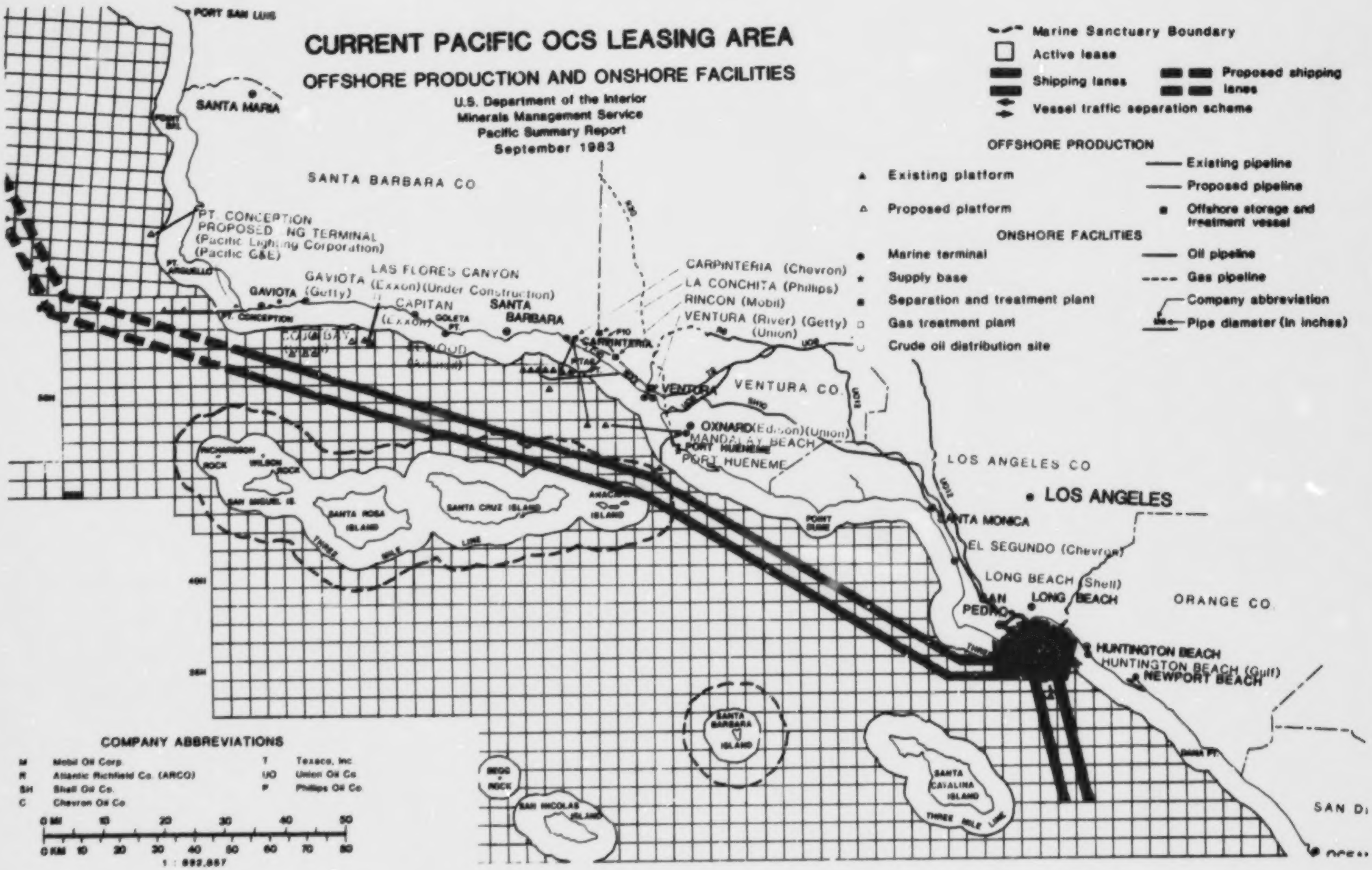
8. APPENDICES



APPENDIX 'A'

U.S. DEPARTMENT OF INTERIOR, M.M.S.
OFFSHORE PRODUCTION & ONSHORE FACILITIES
AND
ACTIVE LEASES, FIELDS, UNITS PLATFORMS & OPERATIONS

SEPTEMBER 1983



CURRENT PACIFIC OCS LEASING AREA

OFFSHORE PRODUCTION AND ONSHORE FACILITIES

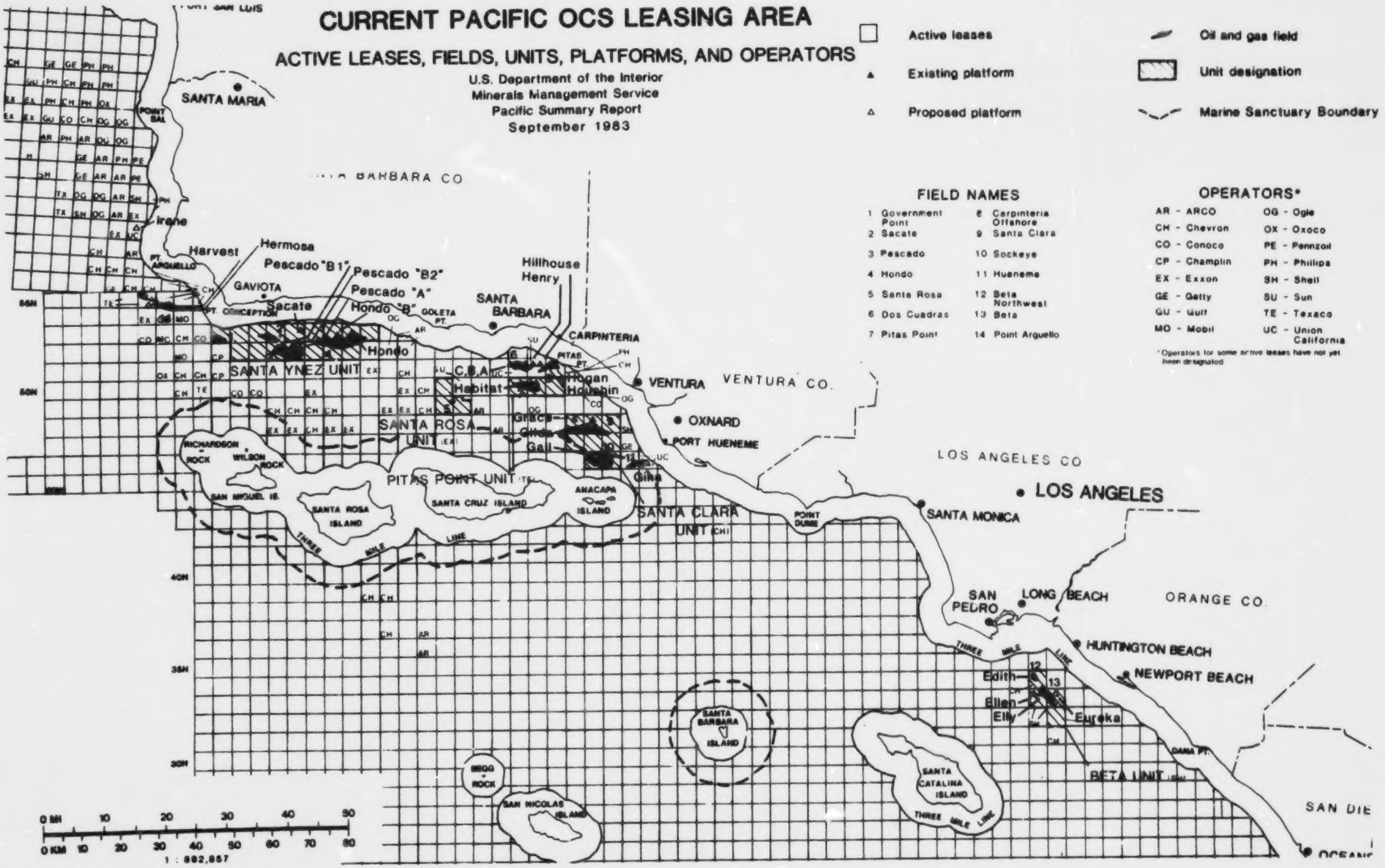
U.S. Department of the Interior
Minerals Management Service
Pacific Summary Report
September 1983

Marine Sanctuary Boundary
Active lease
Shipping lanes
Proposed shipping lanes
Vessel traffic separation scheme
OFFSHORE PRODUCTION
Existing platform
Proposed platform
Existing pipeline
Proposed pipeline
Offshore storage and treatment vessel
ONSHORE FACILITIES
Marine terminal
Supply base
Separation and treatment plant
Gas treatment plant
Crude oil distribution site
Oil pipeline
Gas pipeline
Company abbreviation
Pipe diameter (in inches)
PORT SAN LUIS
SANTA MARIA
SANTA BARBARA CO
PT. CONCEPTION
PROPOSED NG TERMINAL
(Pacific Lighting Corporation)
(Pacific G&E)
PT. ARGUELLO
GAVIOTA
GAVIOTA (Getty)
PT. CONCEPTION
LAS FLORES CANYON
(Exxon)(Under Construction)
CAPITAN
(Exxon)
GOLETA PT.
SANTA BARBARA
CARPINTERIA
CARPINTERIA (Chevron)
LA CONCHITA (Phillips)
RINCON (Mobil)
VENTURA (River) (Getty)
(Union)
VENTURA
VENTURA CO.
OXNARD (Edison)(Union)
MANDALAY BEACH
PORT HUENEME
PORT HUENEME
LOS ANGELES CO
LOS ANGELES
SANTA MONICA
EL SEGUNDO (Chevron)
LONG BEACH (Shell)
SAN PEDRO
LONG BEACH
ORANGE CO.
HUNTINGTON BEACH
HUNTINGTON BEACH (Gulf)
NEWPORT BEACH
DANA PT.
SAN D
OCEA
POINT DUME
RICHARDSON ROCK
WILSON ROCK
SAN MIGUEL IS.
SANTA ROSA ISLAND
SANTA CRUZ ISLAND
ANACAPA ISLAND
THREE MILE LINE
SANTA BARBARA ISLAND
BEGG ROCK
SAN NICOLAS ISLAND
SANTA CATALINA ISLAND
THREE MILE LINE
COMPANY ABBREVIATIONS
M Mobil Oil Corp.
R Atlantic Richfield Co. (ARCO)
SH Shell Oil Co.
C Chevron Oil Co
T Texaco, Inc
UO Union Oil Co
P Phillips Oil Co
0 MI 10 20 30 40 50
0 KM 10 20 30 40 50 60 70 80
1 : 892,857

CURRENT PACIFIC OCS LEASING AREA

ACTIVE LEASES, FIELDS, UNITS, PLATFORMS, AND OPERATORS

U.S. Department of the Interior
Minerals Management Service
Pacific Summary Report
September 1983



☐ Active leases
▲ Existing platform
△ Proposed platform
Oil and gas field
▨ Unit designation
Marine Sanctuary Boundary
FIELD NAMES
1 Government Point
2 Sacate
3 Pescado
4 Hondo
5 Santa Rosa
6 Dos Cuadras
7 Pitas Point
8 Carpinteria Offshore
9 Santa Clara
10 Sockeye
11 Hueneme
12 Beta Northwest
13 Beta
14 Point Arguello
OPERATORS*
AR - ARCO
CH - Chevron
CO - Conoco
CP - Champlin
EX - Exxon
GE - Getty
GU - Gulf
MO - Mobil
OG - Ogle
OX - Oxoco
PE - Pennzoil
PH - Phillips
SH - Shell
SU - Sun
TE - Texaco
UC - Union California
*Operators for some active leases have not yet been designated
PORT SAN LUIS
SANTA MARIA
POINT SAL
SANTA BARBARA CO
Irene
Harvest
PT. ARGUELLO
Hermosa
Pescado "B1"
Pescado "B2"
Pescado "A"
Hondo "B"
GAVIOTA
PT. CONCEPTION
Sacate
Hondo
GOLETA PT.
SANTA BARBARA
Hillhouse
Henry
CARPINTERIA
PITAS PT.
Hogan
Houchin
VENTURA
VENTURA CO.
OXNARD
PORT HUENEME
SANTA YNEZ UNIT
C.B.A.
Habitat
Grace
Gilda
Gail
Gina
SANTA ROSA UNIT (EX)
PITAS POINT UNIT (TE)
SANTA CLARA UNIT (CH)
RICHARDSON ROCK
WILSON ROCK
SAN MIGUEL IS.
SANTA ROSA ISLAND
SANTA CRUZ ISLAND
ANACAPA ISLAND
THREE MILE LINE
LOS ANGELES CO
LOS ANGELES
SANTA MONICA
POINT DUME
SAN PEDRO
LONG BEACH
ORANGE CO.
HUNTINGTON BEACH
NEWPORT BEACH
Edith
Ellen
Elly
Eureka
BETA UNIT (SH)
DANA PT.
SANTA BARBARA ISLAND
SANTA CATALINA ISLAND
BEGG ROCK
SAN NICOLAS ISLAND
SAN DIE
OCEANS
55N
50N
45N
40N
35N
30N
0 MI 10 20 30 40 50
0 KM 10 20 30 40 50 60 70 80
1 : 882,857

APPENDIX 'B'

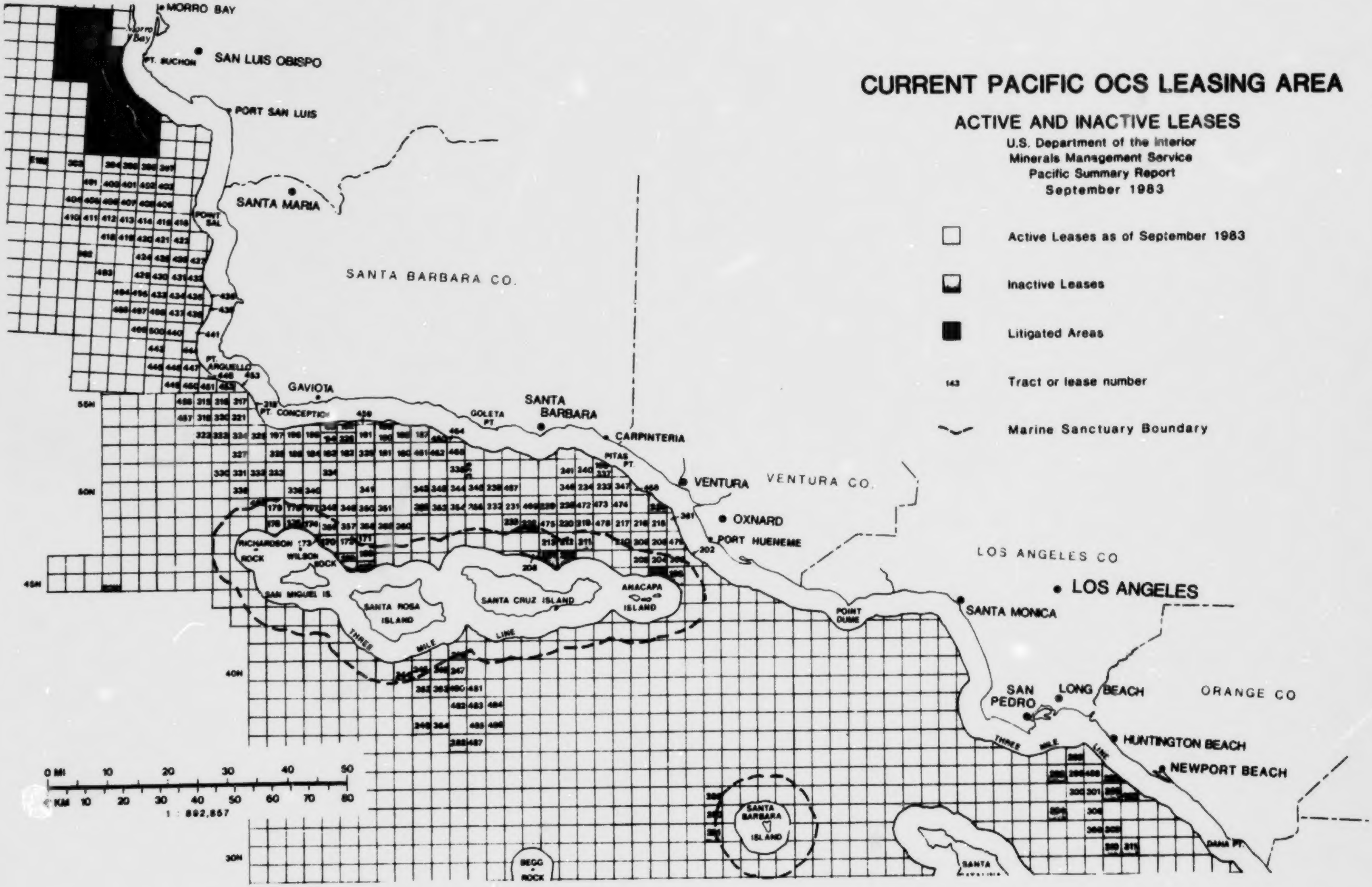
U.S. DEPARTMENT OF INTERIOR, M.M.S.

LEASING REGIONS AND BATHYMETRY

CURRENT PACIFIC OCS LEASING AREA

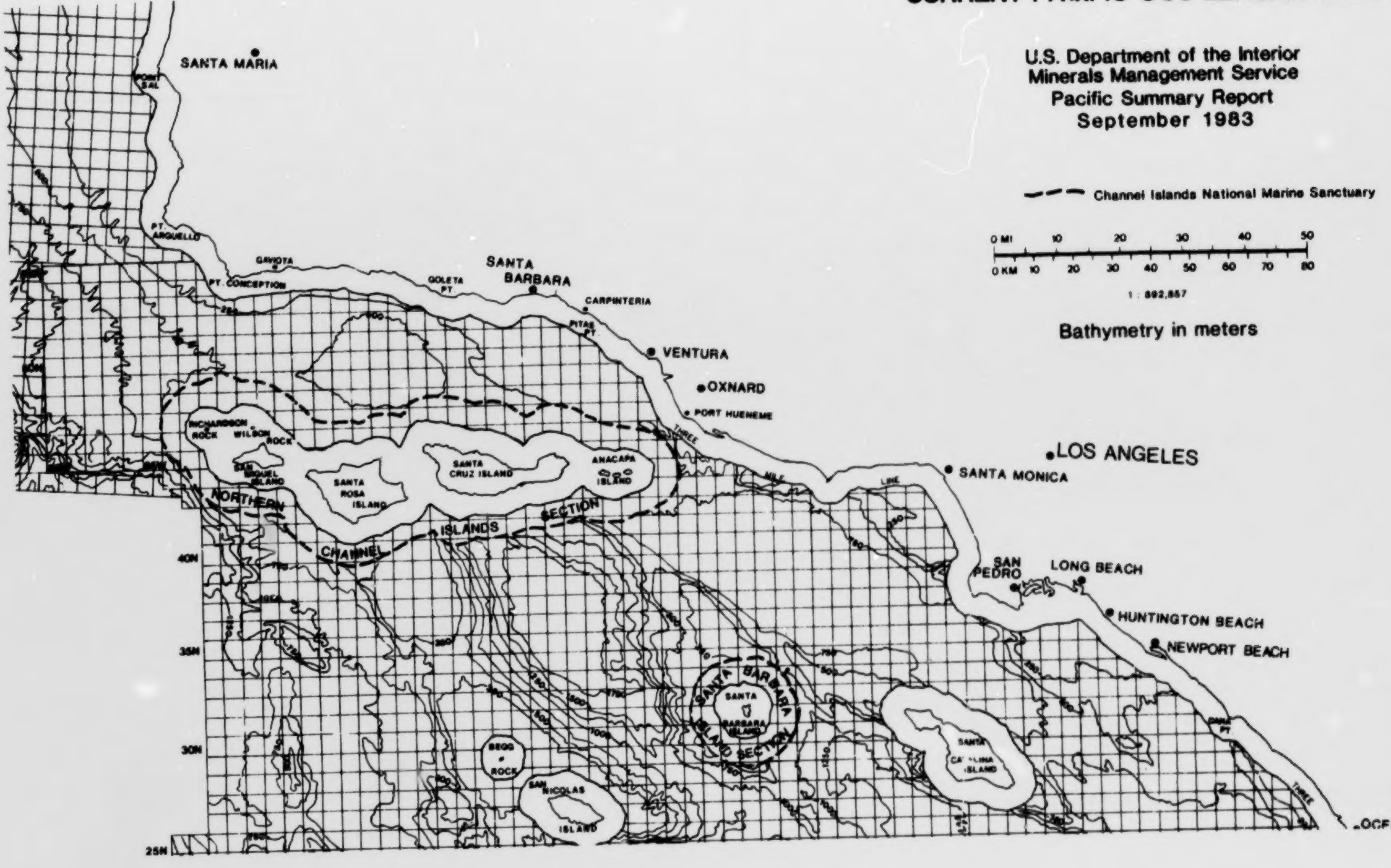
ACTIVE AND INACTIVE LEASES

U.S. Department of the Interior
Minerals Management Service
Pacific Summary Report
September 1983


☐ Active Leases as of September 1983
Inactive Leases
■ Litigated Areas
143 Tract or lease number
Marine Sanctuary Boundary
MORRO BAY
Morro Bay
PT. BUCHON
SAN LUIS OBISPO
PORT SAN LUIS
SANTA MARIA
POINT SAL
SANTA BARBARA CO.
PT. ARGUELLO
GAVIOTA
PT. CONCEPTION
GOLETA PT
SANTA BARBARA
CARPINTERIA
PITAS PT.
VENTURA
VENTURA CO.
OXNARD
PORT HUENEME
LOS ANGELES CO
LOS ANGELES
SANTA MONICA
POINT DUME
SAN PEDRO
LONG BEACH
ORANGE CO
HUNTINGTON BEACH
NEWPORT BEACH
DANA PT.
RICHARDSON ROCK
WILSON ROCK
SAN MIGUEL IS.
SANTA ROSA ISLAND
SANTA CRUZ ISLAND
ANACAPA ISLAND
THREE MILE LINE
SANTA BARBARA ISLAND
BEGG ROCK
SANTA CATALINA
55N
50N
45N
40N
30N
0 MI 10 20 30 40 50
0 KM 10 20 30 40 50 60 70 80
1 : 892,857

CURRENT PACIFIC OCS LEASING AREA

U.S. Department of the Interior
Minerals Management Service
Pacific Summary Report
September 1983



Channel Islands National Marine Sanctuary
0 MI 10 20 30 40 50
0 KM 10 20 30 40 50 60 70 80
1 : 892,857
Bathymetry in meters
SANTA MARIA
POINT SAL
PT. ARGUELLO
GAVIOTA
PT. CONCEPTION
GOLETA PT
SANTA BARBARA
CARPINTERIA
PITAS PT
VENTURA
OXNARD
PORT HUENEME
LOS ANGELES
SANTA MONICA
SAN PEDRO
LONG BEACH
HUNTINGTON BEACH
NEWPORT BEACH
DANA PT
OCEANSIDE
THREE MILE LINE
RICHARDSON ROCK
WILSON ROCK
SAN MIGUEL ISLAND
SANTA ROSA ISLAND
SANTA CRUZ ISLAND
ANACAPA ISLAND
NORTHERN CHANNEL ISLANDS SECTION
SANTA BARBARA ISLAND SECTION
SANTA BARBARA ISLAND
BEGG ROCK
SAN NICOLAS ISLAND
SANTA CATALINA ISLAND
40N
35N
30N
25N

APPENDIX 'C'

SCHEDULE OF CALIFORNIA OFFSHORE DRILLING ACTIVITIES

SCHEDULE OF CALIFORNIA
OFFSHORE DRILLING ACTIVITIES

COMPANY	LOCATION OCS - P	FIELD/ WELL TYPE	WATER/ DRILLING DEPTH	COMMENTS
ARCO	484/486	Coal Oil Point		- securing exploration permits from MMS - P & A, oil, tight
	444		218'/9,600'	- has permits for five additional locations - possibly same structure tapped by Exxon and Union - used J/U JPP III, 3 mile south of Union discovery, drilling started Dec. 1983
	425-1		398/3,681	- thought to be find of very heavy oil
	425-2		405'/5,740'	- plugged and abandoned
	430-1		325'/5,772'	- P & A, tight
	PRC-309	discovery well	4,350'	- 2 miles offshore Goleta tested at 4138 B/D - securing permits for platforms
EXXON	411-1		1,196/5,303	- P & A reputed non-commercial heavy oil strike - most westerly Santa Maria test
	438A		246'/8,000'	- planned
	438B		235'/8,000'	- planned
	440-1	discovery	259'/8,000'	- recent discovery tested at 1815 B/D and 1413 B/D
	440-2		305'/8,000'	- possible extension of Union discovery in OCS-0441 - using D/S Glomar Pacific 2 mi N.W. of Union discovery - spudded in July 1983 using the Glomar Pacific drillship
	440-C		295'/8,000'	- planned
	440-D		315'/8,000'	- planned
UNION	0441	discovery	264'/4,489'	- drilled by Diamond M General B/D combined rate three zones WS/S-4300 - eight miles N. of Pt. Arguello

COMPANY	LOCATION OCS -	FIELD/ WELL TYPE	WATER DRILLING DEPTH	COMMENTS
UNION (cont'd)				- P & A plugged and abandoned - drilled with the Diamond M General Semi-sub - structure is 5 mi x 1 mile - Union 1/3 interest
	441-2	confirmation	246/5,430	- P & A
TEXACO	494-1			- seeking permits for wildcats
	496-1			
	315-1	discovery (Arguello)	789/13,251	- spudded in October, 1981 - 12 miles W. of Pt. Conception - combined flow 4200 B/D of 11-23° gravity oil
	315-2	confirmation	891/10,200	- combined flow 3,000 B/D - 1 mile N.W. of 315-1
	315-3	delineation	1,043/8,500	- combined flow 1,900 B/D
PHILLIPS	State 2933	(Molina) discovery	/11,397	- gas and condensate discovery - 18 miles S.E. of Pt Conception - Molina Field is 20 years old - flowed 22.9 MMcfd and 230 B/D of condensate
	402-1	wildcat	653/8,787	- drilled by Sedco 702 S/S in late June, 1983 - 2 mi. N.W. of Oxy discovery well off Point Sal - maybe San Miguel formation - P & A
	397-1		312/3,666	- P & A, oil, tight drilled by Glomar Coral Sea - to test 396 structure
	396-1		544/7,743	- showed some oil - next to sea otter habitat - P & A, tight - with Chevron
	426-1			- planned
CHEVRON	433-1		891/6,967	- Dry hole
	446-1		1020'/6,481'	- tested 1400 B/D in NW Pt Arguello
	446-2	confirmation	778'/6,735'	- used Diamond M Eagle semi-sub
	450-1	discovery (Arguello)	392'/11,950'	- spudded in 1982 by Chevron/Phillips - flowed at combined rate of 2,778 B/D of 29-34° gravity oil and 875 Mcfd

COMPANY	LOCATION OCS -	FIELD/ WELL TYPE	WATER DRILLING DEPTH	COMMENTS
CHEVRON (cont'd)	450-2	step out	844/9,257	- P & A
	450-3	step out	426/8,881	- P & A
	450-4	Active step-out	1,097/8,100	- being drilled by Diamond M Eagle drillship
	451-2	wildcat	301/10,704	- P & A
	452-1	apparent discovery	278/7,430	
	452-2	step-out	330/7,496	
	452-3	Active step-out	310/8,000	
	452-4	Active step-out	266/8,700	- being drilled by Key Singapore
	316-1	discovery (Arguello)	635'/9,621'	- combined flow 6,480 B/D of 18-22° gravity oil and 1.68 MMcfd of gas - submitted development and production plans to MMS - 10 miles off Pt Conception
	316-2	confirmation (Arguello)	561'/11,416'	- combined flow 3,800 B/D of 18-21° gravity oil and 860 Mcfd gas - 1 mi. N.W. of discovery well
	317-1	discovery	325'/8,955'	- P & A, tight, heavy oil
	318-1	discovery	262'/9,643'	- P & A, tight, heavy oil - to the east and independent of Pt Arguello Field
	318-2	confirmation	253'/8,100'	- planned
	318-3			- planned
GETTY	394-1		/7,800'	- P & A, tight
	395-1	wildcat		- drilled by Zapata Concord S/S
			514'/4,012'	- P & A, tight
	424-1			- planned
	429-1	discovery	878'/8,071'	- three zones flowed 3,600 B/D of 12.6-17° gravity oil
	449-1			- 9 miles S.W. of Pt Arguello - drilled from Zapata Concorde S/S
	449-2	confirmation		- planned for mid 1984. If successful, may install a new platform

COMPANY	LOCATION OCS - P	FIELD/ WELL TYPE	WATER DRILLING DEPTH	COMMENTS
OCCIDENTAL	409-1	(San Miguel) discovery	507'/6,630'	- tested 1,550 B/D of 17° gravity oil and 840 Mcfd of gas - not yet determined commercial - development and production plans filed with MMS - productions requirements under study by Bechtel/PMB - off Point Sal, 30 miles N. of Pt Argullo - underlies P-0402, 0403 and 0408 held by Chevron/Phillips
	409-2	step-out	436'/8,400'	- P & A, tight
	409-3	step-out	356'/8,500'	- P & A, tight
	409-4	active step-out	502/8,000	- being drilled by Penrod 73 S/S
READING & BATES	415-1	wildcat	413'/11,000'	- Jim Cunningham S/S to drill, awaiting permit
	415-2			- planned
	416-1			- planned
OGLE PETROLEUM	433			- drilled 8 miles of Pt Sal
	495			- south of San Miguel Field - believed to be seperate from Oxy discovery
SHELL	435-1		246/6,900	- P & A, tight, oil (just N. of Exxon test) - Union has interest
CONOCO	413-1	wildcat	1,017/9,000	- P & A, tight
	320-1	wildcat	824'/8,600'	- P & A, tight - possibly edge of Arguello resevoir
	322-1	discovery	1,544'/9,343	- combined flow 2,100 B/D with artificial lift - very heavy oil - non commercial
	325-1	wildcat	836/11,957	- P & A, tight
	334-1			
PENNZOIL	427-1		264'/6,500'	- P & A, tight
	432-1		/7,000	- follow up planned to 427-1

COMPANY	LOCATION OCS -	FIELD/ WELL TYPE	WATER DRILLING DEPTH	COMMENTS
MOBIL	321-1	wildcat	437'/11,463'	- drilled with Penrod 73 P & A, tight
	321-2	wildcat	459/10,500	- P & A, tight
CHAMPLIN	328-1			- planned - bottomhole location in 333

sh:ID# 0166P

APPENDIX 'D'

PROPOSED OFFSHORE PLATFORMS

PROPOSED OFFSHORE PLATFORMS

CALIFORNIA

COMPANY	PLATFORM FIELD LEASE OCS-P	WATER DEPTH	TOTAL PRODUCTION	WELL SLOTS	COMMENTS
ARCO 75% AMINOIL 25%	Coal Oil Point 308/309		50,000 B/D 50 MMcfd by end of decade		- Securing permits for 2 platforms for next 2-3 years - 2 miles offshore Goleta - discovery well PRC 309 drilled to 4,350 ft, tested at 4138 bld
EXXON	Hondo B Hondo (Santa Ynez Unit) OCS-0190	1200' (record depth)		60	- proposed for 1988 production - $ 3 bellion development and production plan filed with MMS in Nov. 1982 - 3 miles west of Hondo 'A' - will include either expansion of OS &T processing or piping of fluids to new plant at Las Flores Canyon
	Pescado A Pescado (Santa Ynez Unit) OCS-182	1075'		60	- proposed for 1989 production
	or				
	Pescado B-1 Pescado Santa Ynez OCS-183	1025'		28	- proposed for 1999 production
	Pescado B-2 Pescado	1140'		60	- proposed for 1989 production

COMPANY	PLATFORM FIELD LEASE OCS-P	WATER DEPTH	TOTAL PRODUCTION	WELL SLOTS	COMMENTS
EXXON (cont'd)	(Santa Ynez Unit) OCS-182				
	Sacate Sacate (Santa Ynez Unit) OCS-193	620'		28	- proposed for 1990 production - with all four or five platforms in operation by early 1990's, daily production will be 140,000 barrels
UNION	Irene Pt Pedernales 0441	264'	20,000 B/D	72	- development drilling to start 1985 - designed to link to existing Lompoc onshore field - 8 miles N. of Pt Arguello, 5 miles offshore - discovery well drilled to 4489' in 264' water by Diamond M General - structure is 5 miles x 1 mile' - Union 1/3 interest
TEXACO	Harvest Pt Arguello (Hueso) 0315	670'	46,000 B/D 42 MMcfd	50	- installed in 1985 - being build in Korea - project mgt by Brown & Root - oil by P/L to Hermosa platform then to shore
CHEVRON	Ester Wilmington N/A	Island	1,000 B/D	55	- island destroyed by storm in March 1983 - stationary platform to replace island - preliminary design begun by Earl and Wright - installed mid 1986 - estimated cost is $46 million

COMPANY	PLATFORM FIELD LEASE OCS-P	WATER DEPTH	TOTAL PRODUCTION	WELL SLOTS	COMMENTS
CHEVRON (cont'd)	Hidalgo Pt Arguello 0450	430'		56	- installation in late 1986 at cost 250 MM$ - 1987 production startup - development & production plans submitted to MMS - on record breaking lease cost of 333.6 MM$ - discovery well drilled to 11,950' in 392' of water in 1982 by Chevron/Phillips - gravities 29.3°-34.4° - Pt. Arguello field estimated reserves of at least 500 million barrels
	Hermosa Pt Arguello 0316	602'	30,000 B/D peak in 1987	48	- to be installed in 1985 - production in 1986 - 10 miles offshore of Pt. Conception
	Gail Santa Clara (Sockeye) 0205	740'	Oil 10,000	36	- to be installed in late 1986 - estimated cost $250 million - 10 miles off Ventura - 50-100 million bbls estimated reserve - oil to go to platform Grace
SHELL	Eureka Beta 0301	700'		60	- 9 miles offshore of Huntington Beach - installation mid 1984 development drilling in 1985 - produce to Elly, then to shore via existing 16"⌀ pipeline to Long Beach facility

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APPENDIX 'E'

PLATFORMS SCHEDULED FOR PRODUCTION DEPLOYMENT

PLATFORMS SCHEDULED FOR PRODUCTION DEPLOYMENT

	1984	1985	1986	1987	1988	1989	1990	1991
Company: Shell								
Platform: EUREKA								
Jacket Installation	July							
Topsides on Site	Sept							
Drilling to Start		1Q						
Company: Texaco								
Platform: HARVEST								
Installation		June						
Drilling to Start		Oct						
Production			1Q					
Company: Chevron								
Platform: HERMOSA								
Installation		Mid						
Production			1Q					

Note: Q = quarter

	1984	1985	1986	1987	1988	1989	1990	1991
Company: Chevron (cont'd)								
Platform: HIDALGO								
Topsides Fabrication Bid	Dec							
Topsides Fabrication Awarded		Apr						
Jacket Launched			June					
Topsides Installation			4Q					
Production				1Q				
Platform: GAIL								
Topsides Fabrication Bid	Jan							
Topsides Fabrication Awarded		June						
Jacket Construction Bid		Aug						
Installation			4Q					
Production				Apr				
Company: Union								
Platform: IRENE								
Installation		Mid						
Drilling to Start		4Q						
Production			1Q					

Note: Q = quarter

	1984	1985	1986	1987	1988	1989	1990	1991
Company: Exxon								
Platform: HONDO 'B'								
Installation					2Q			
Drilling to Start						1Q		
Production						2Q		
Platform: PESCADO A								
Installation					4Q			
Drilling to Start						3Q		
Production						4Q		
Platform: PECSADO B-1								
Installation						2Q		
Drilling to Start							1Q	
Production							2Q	
Platform: SACATE								
Installation						4Q		
Drilling to Start							3Q	
Production							4Q	

Note: Q = quarter

APPENDIX 'F'

EXISTING OFFSHORE PRODUCTION PLATFORMS

EXISTING OFFSHORE PRODUCTION PLATFORMS

CALIFORNIA

COMPANY	PLATFORM FIELD LEASE OCS-P	INSTALLED 1ST PROD'N	DEPTH OF WATER AVG. WELL	DIST. TO SHORE (mi)	PRODUCTION RATE	WELL SLOTS	COMMENTS
ARCO	Holly Coal Oil Point	1967 1967			9,000 B/D	30	- within 3 mile limit offshore of Ellwood
	2 Pyramids	late 1982 1983	220' N/A	1.5	500 B/D, 50 MCFD design capacity		- containment structure to capture oil & gas seeps from ocean floor - 100 feet square, 50 feet high - gas piped ashore to Arco's Ellwood plant via a 6", 2,000 ft. line - oil periodically shipped by barge to Arco's Watson Refinery in Carson California
EXXON	Hondo A Hondo 0188 (Santa Ynez Unit)	1976 April 1981	850' N/A	4.8	40,000 B/D 26 MMCFD	28	- field discovered in 1969, 5 miles offshore Gaviota - all oil produced to OS&T (offshore storage and treatment) vessel anchored just outside the 3 mile limit, OS&T cost 155 MM$ - OS&T built by Karsen in Oakland - on OS&T gas is sweentened and crude is dehydrated, stabilized, sweentened and stored - 8 " gas pipeline to shore then to Las Flores Canyon facility - all wells to go on gas lift (some already are) - 14-20^{0} API crude - estimated reserves of 400 million barrels in Santa Ynez Unit
UNION	Gina Hueneme 0202	Dec 1980 N/A	95' 5500'	4.0	6500 B/D 1.9 MMCFD	15	- 4 miles west of Port Hueneme - 10" line carries crude, gas and produced water to shore - 6" line from shore returns water for reinjection - development drilling completed

COMPANY	PLATFORM FIELD LEASE OCS-P	INSTALLED 1ST PROD'N	DEPTH OF WATER AVG. WELL	DIST. TO SHORE (mi)	PRODUCTION RATE	WELL SLOTS	COMMENTS
UNION (cont'd)	Gilda Santa Clara 0216	Jan 1981 Jan 1982	205' 7000'	8.5	8,000 B/D	96	- 10 miles west of Oxnard - gas separated on platform and moved via 10" line to shore. Crude and produced water sent by 12" line to shore. Produced water separated on shore and returned in in 6" line to platform for reinjection - onshore treating/separation facility located at Mandalay Beach and shared witn platform Gina - future drilling into formation at 12,000' planned
	A Dos Cuadros 0241	Sept 1968 June 1969	188' N/A		14,000 B/D	57	- production peaked in 1970 - 6 miles offshore summerland
	B Dos Cuadros 0241	Nov 1968 June 1969	188' N/A			63	
	C Dos Cuadros 0241	Feb 1977 Aug 1977	193' N/A			60	
TEXACO	Habitat Pitas Point 0234	Oct 1981 Nov 1983	303' 10,800'	9.0	Gas only 80 MMCFD	24	- discovery well drilled in 1968 near eastern end of Santa Barbara Channel - gas to Pacific Interstate Pipeline - gas is sweet and dry - many wells with dual completions - future additional completions - future additional compression facilities planned
SUN	Hillhouse Dos Cuadros 0240	Nov 1969 July 1970	190' N/A	5.7		60	

COMPANY	PLATFORM FIELD LEASE OCS-P	INSTALLED 1ST PROD'N	DEPTH OF WATER AVG. WELL	DIST. TO SHORE (mi)	PRODUCTION RATE	WELL SLOTS	COMMENTS
SUN (cont'd)	Henry Carpinteria 0240	Aug 1979 May 1980	291'	4.4		28	
PHILLIPS	Hogan Carpinteria 0166	Sept 1967 June 1968	150'	3.7		66	
	Houchin Carpinteria 0166	July 1968 Apr 1969	151'	5.1		60	
CHEVRON	Grace Santa Clara 0217	July 1979 July 1980	318' 12,000'	10.4		48	- 11 miles S.W. of Ventura - designed by Brown & Root - jacket fabrication in Japan
CHEVRON	Edith Beta 0296	Jan 1983 1984	160'	8.4	7900 B/D peak est.	72	- 8.5 miles off Huntington Beach in San Pedro Bay - peak production in 1985 - production to start soon to Shell's platform Elly
	Ester Beta	1965 1965	island		1800 B/D before storm	99	- in operation since 1965 - destroyed by storm in 1983 - will replace with steel platform
	Heidi Heidi				1600 B/D from Heidi and Hope		- 50% with Arco - off coast of Carpinteria
	Hope Hope				1600 B/D from Heidi and Hope		- 50% with Arco - off coast of Carpinteria

COMPANY	PLATFORM FIELD LEASE OCS-P	INSTALLED 1ST PROD'N	DEPTH OF WATER AVG. WELL	DIST. TO SHORE (mi)	PRODUCTION RATE	WELL SLOTS	COMMENTS
SHELL	Ellen Beta 0300	Jan 1980 Jan 1981	265'	8.8	12,00 B/D	80	- drilling platform offshore Long Beach in Gulf of Santa Catalina - produces to production platform Elly - has 2 rigs with 25,000' capacity - development drilling to be completed in 1984 - total cost $130 million - uses electirc submersible artificial lift pumps - future water flood planned - production to peak in late 1980's to 20,000 B/D
	Elly Beta 0300	Mar 1980	255'	10.0			- production platform for Ellen and future Eureka drilling platforms - designed to handle 26,000 B/D oil and 100,000 B/D water - 16" pipeline, 18 miles long takes production to shore - to begin steam injection to boost recovery
AMINOIL	Emmy Huntington Beach						

APPENDIX 'G'

SUMMARY OF ONSHORE FACILITIES

(PROPOSED DEVELOPMENTS & GENERAL MAPS)

Summary of Onshore Facilities

(proposed development)

1. Exxon Santa Ynez Unit

Two Oil and Gas Treatment Facility Options

Proposed Project - Continuation of Offshore Oil Treatment on OS&T (Exxon's Development Option A).

- Expand OS&T oil treating from 40 (current capacity) to 80 thousand barrels per day (MBOD).
- Expand Las Flores Canyon gas treatment facility to 90 million standard cubic feet per day (MMSCFD) (existing capacity is 30 MMSCFD with expansion capacity of 60 MMSCFD).
- Install offshore pipelines and power cables to convey produced fluids and electricty between platforms and OS&T.
- Product crude oil would continue to be loaded onto marine vessels at the OS&T for transport to refining facilities.

Proposed Project Alternative - Construction of New Onshore Oil Treating Facility in Corral/Las Flores Canyons (Exxon's Development Option B).

- Construct oil treatment facility with capacity of 140 MBOD and remove OS&T.
- Install offshore pipelines (oil, gas, power, and water discharge).
- Expand onshore gas treating facilities to 135 MMSCFD (currently permitted for 60,000 MMSCFD).
- Construct three new oil storage tanks (total capacity 550,000 bbls).
- Construct 50 MW cogeneration plant to produce electricity from gas for offshore platforms and onshore oil treatment and recover waste heat to provide process heat to the onshore oil and gas treating facilities.
- Construct new electrical substation adjacent to existing switchgear pad at mouth of Corral Canyon.
- Construct new nearshore marine terminal:
  - one SALM (Single Anchor Leg Mooring) in State waters, 5,000 feet offshore in 140 feet of water.
  - Shore to terminal pipelines (36 inch crude oil line, 16 inch vapor balance line, and service line).
  - Anticipated size of vessels to be loaded is 60,000 deadweight tons.
  - Vapor Balance System.

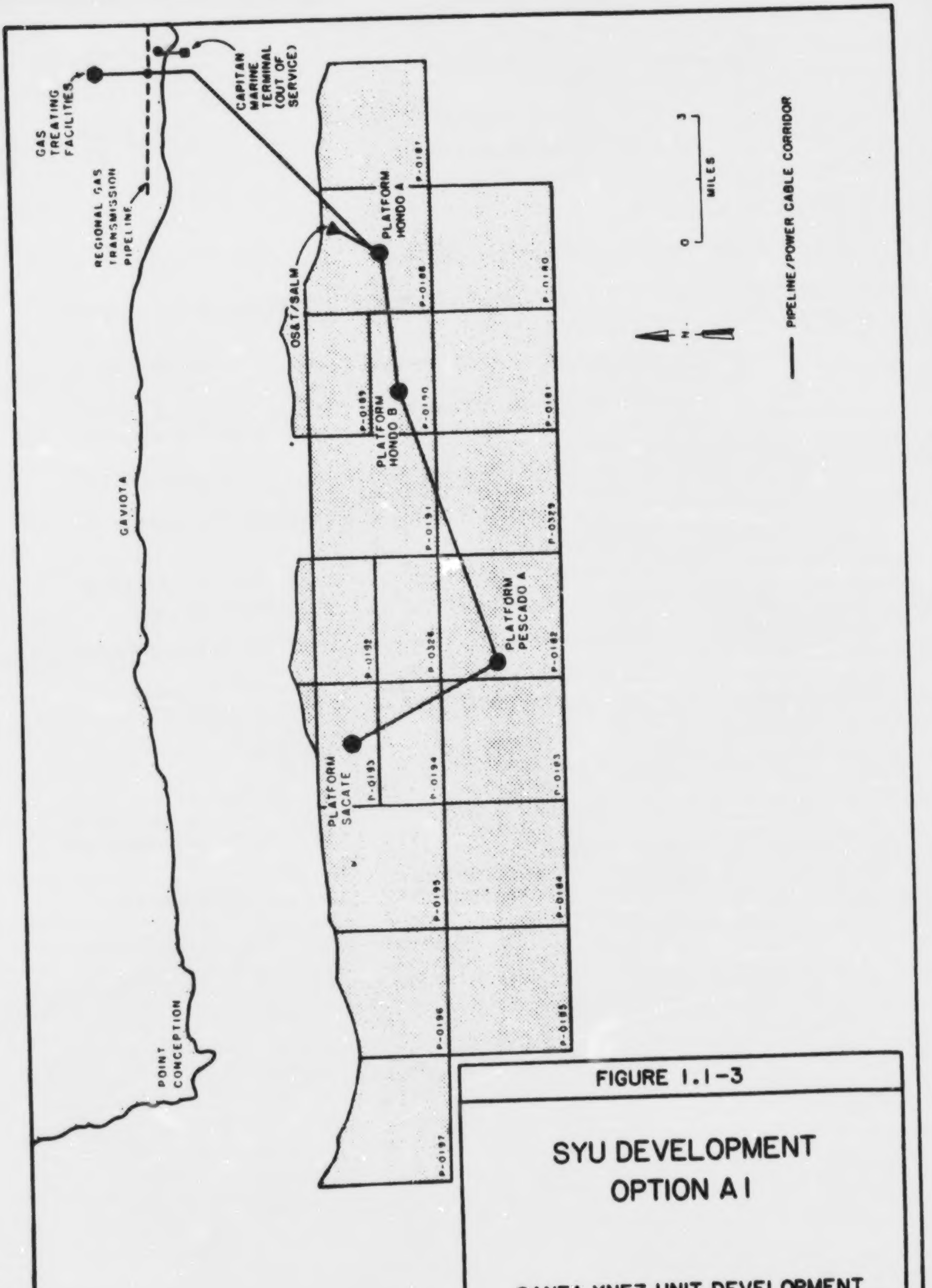
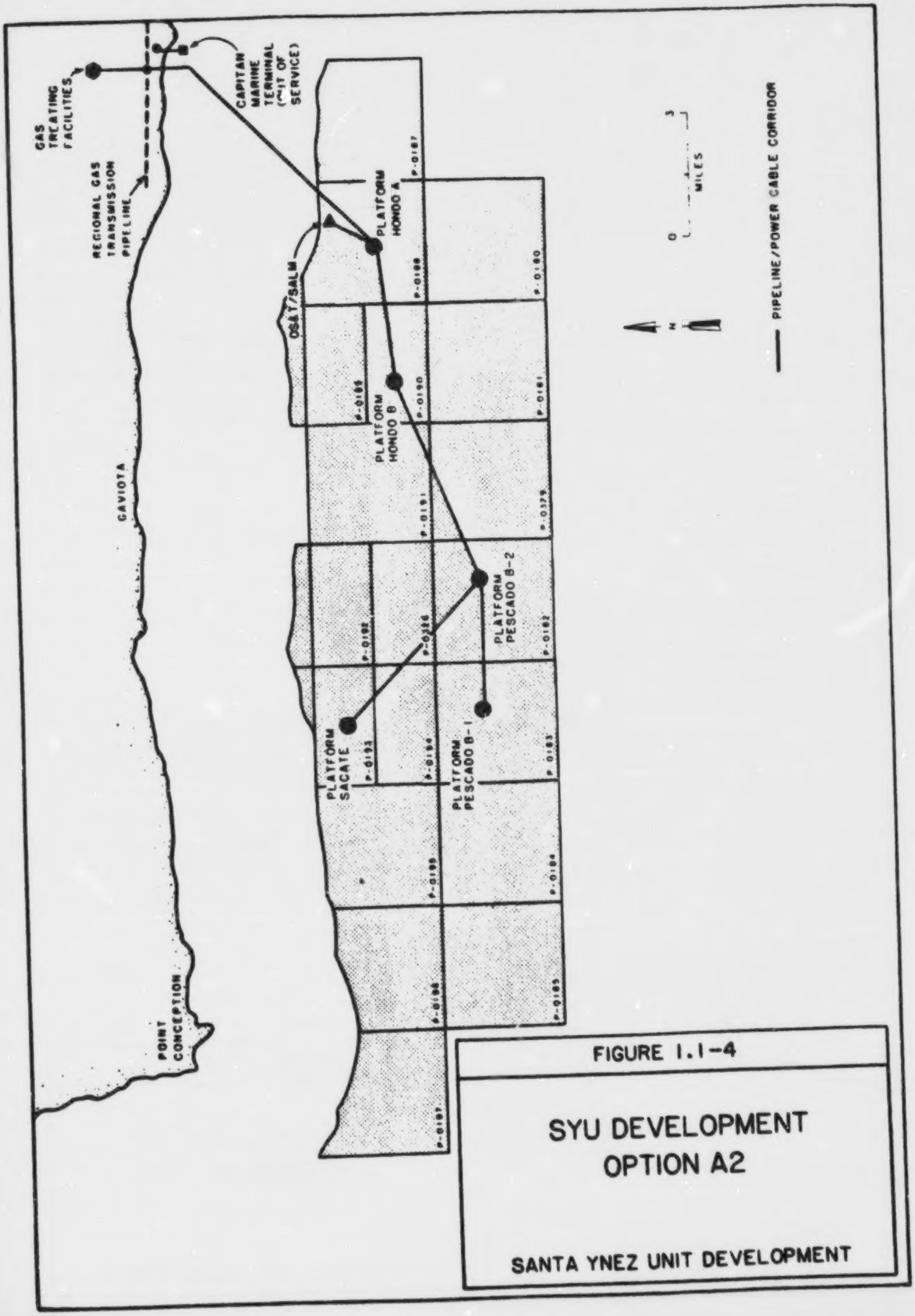

GAS TREATING FACILITIES
REGIONAL GAS TRANSMISSION PIPELINE
CAPITAN MARINE TERMINAL (OUT OF SERVICE)
OS&T/SALM
PLATFORM HONDO A
PLATFORM HONDO B
PLATFORM PESCADO A
PLATFORM SACATE
GAVIOTA
POINT CONCEPTION
P-0187
P-0188
P-0180
P-0189
P-0190
P-0181
P-0191
P-0329
P-0192
P-0326
P-0182
P-0193
P-0194
P-0183
P-0195
P-0184
P-0196
P-0185
P-0197
N
0
3
MILES
PIPELINE/POWER CABLE CORRIDOR

FIGURE 1.1-3

SYU DEVELOPMENT
OPTION A1

SANTA YNEZ UNIT DEVELOPMENT


GAS TREATING FACILITIES
REGIONAL GAS TRANSMISSION PIPELINE
CAPITAN MARINE TERMINAL (OUT OF SERVICE)
GAVIOTA
POINT CONCEPTION
OS&T/SALM
PLATFORM HONDO A
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PLATFORM PESCADO B-1
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3
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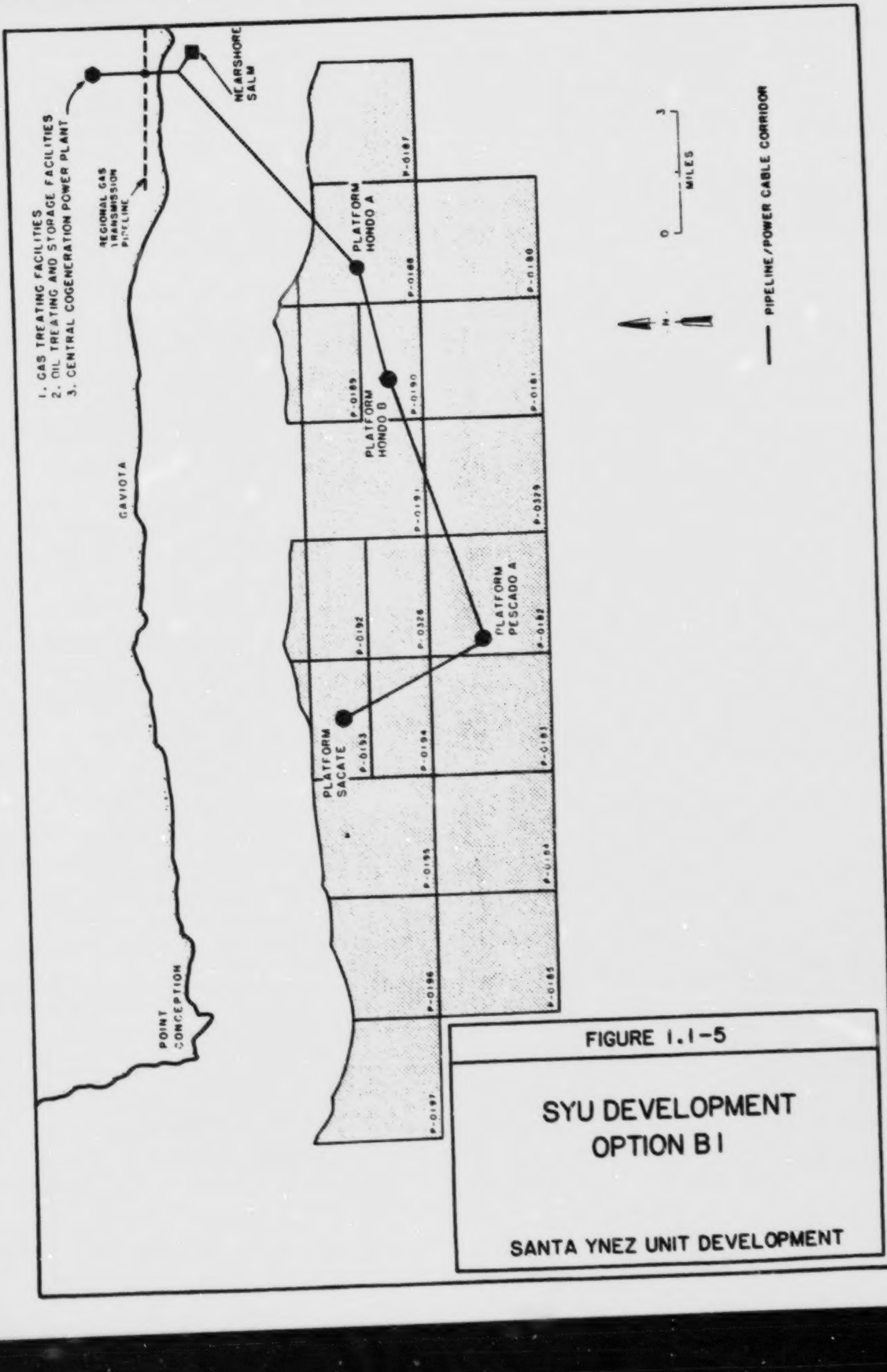
PIPELINE/POWER CABLE CORRIDOR

FIGURE 1.1-4

SYU DEVELOPMENT
OPTION A2

SANTA YNEZ UNIT DEVELOPMENT


1. GAS TREATING FACILITIES
2. OIL TREATING AND STORAGE FACILITIES
3. CENTRAL COGENERATION POWER PLANT
REGIONAL GAS TRANSMISSION PIPELINE
NEARSHORE SALM
GAVIOTA
POINT CONCEPTION
PLATFORM HONDO A
PLATFORM HONDO B
PLATFORM PESCADO A
PLATFORM SACATE
P-0187
P-0188
P-0189
P-0190
P-0191
P-0192
P-0193
P-0194
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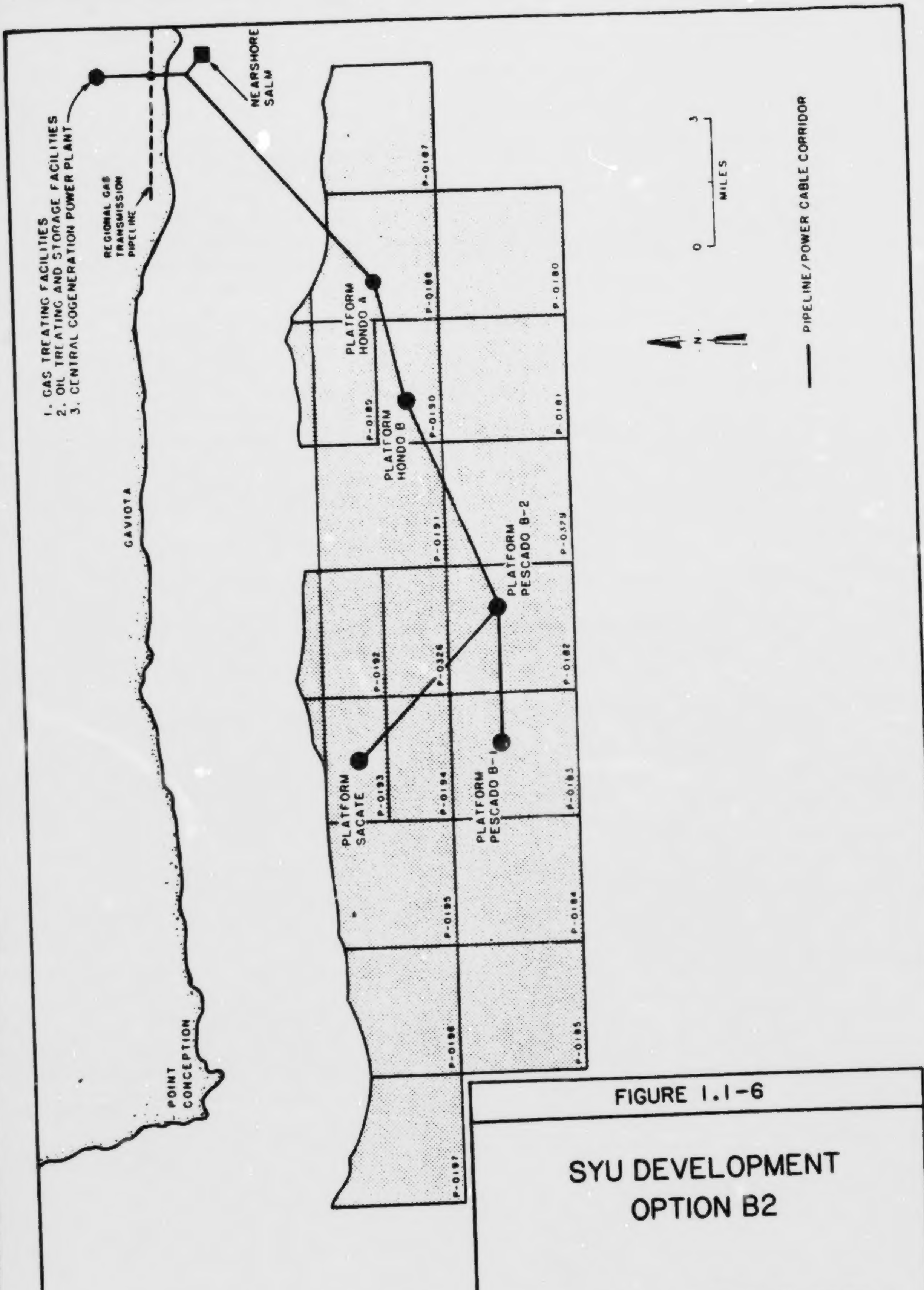
P-0197
P-0180
P-0181
P-0329
P-0326
P-0182
P-0183
P-0184
P-0185
N
0
3
MILES
PIPELINE/POWER CABLE CORRIDOR

FIGURE 1.1-5

SYU DEVELOPMENT
OPTION B1

SANTA YNEZ UNIT DEVELOPMENT


1. GAS TREATING FACILITIES
2. OIL TREATING AND STORAGE FACILITIES
3. CENTRAL COGENERATION POWER PLANT
REGIONAL GAS TRANSMISSION PIPELINE
NEARSHORE SALM
GAVIOTA
POINT CONCEPTION
PLATFORM HONDO A
PLATFORM HONDO B
PLATFORM PESCADO B-2
PLATFORM PESCADO B-1
PLATFORM SACATE
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MILES
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PIPELINE / POWER CABLE CORRIDOR

FIGURE 1.1-6

SYU DEVELOPMENT OPTION B2

SANTA YNEZ UNIT DEVELOPMENT

2. Celeron - Pipeline Develcpment Plan

The All- American Pipeline Company, a subsidiay of Celeron Corporation, has proposed to construct a 1,100 mile long common carrier pipeline from Emidio, California to Midland Texas. The Celeron Corporation, has proposed to construct an additional 130 mile long link from Las Flores Canyon to Emidio via Gaviota and Bluellton. Both pipelines are designed to transport up to 300,000 bbl/day through a 30 inch diameter insulated pipeline.

The proposed Emidio to Las Flores link will require 3 pumping stations located in Las Flores Canyon, at Gaviota and near the north of the Sisquoc River. The oil will be pumped by three 2,000 to 2.500 horsepower centrifugal pumps at each station. Each pump station will include a backup pump as well. No heaters are planned for the Las Flores to Emidio section of the pipeline. Each or pump/heaters pump station site will occupy 5.5 acres.

Each pumping station will contain automatic sensors and remote control equipment for regulating pipeline operation. Each station will include line scraper traps for inspection and maintenance operations. In addition, a check valve will be located adjacent to each major stream crossing.

The pipeline, including all river and road crossings, will be buried. No tank farms are proposed for the Emidio to Las Flores section. A 100 foot wide construction right-of-way and a 20 foot wide maintenance right-of-way will be required along the entire pipeline route.

3, Getty - Gaviota Consolidated Coastal Facility.

Getty proposed to modify and expand the Gaviota facilities to include:

- Amarine terminal expansion to 300,000 barrels per day (BPD) capacity and the ability to handle two tankers between 30,000 and 300,000 dead weight tons (DWT) simultaneously;
- A supply and crew base designed to support peak offshore exploration, development and production needs with a supply and crew boat pier, onshore storage warehouses, truck staging offices, parking and logistical and communications support;
- A crude oil storage facility with tank capacities of approximately 2.74 million barrels; (five 500,000 bbl. tanks, three 80,000 bbl. tanks)
- A pipeline connection from Gaviota to the San Joaquin Valley with a crude oil throughput of 100,000 to 400,000 BPD. Pipeline will require 2-3 pumping stations;
- A new freeway interchange including offramps and an overpass; and
- A lease area for a new oil and gas processing facility (which is being proposed for the Getty Gaviota site by Chevron USA as part of Chevron's Point Arguello Field OCS Development Plan application.)

Construction of certain elements of the proposed facility will be done in phases, keyed to the projected production of offshore oil. In particular, the first phase of marine terminal construction would accommodate a throughput of approximately 250,000 BPD by 1986. While the second phase of facility construction, to be completed if offshore production develops as currently forecast, will provide a total throughput of 500,000 BPD.

4. Chevron - Point Arguello Plan

Chevron's proposed development includes:

- Installing two subsea oil and gas pipelines leading from platform Hermosa to shore;
- Continuing this pipeline system onshore to oil and gas processing facilities;
- Constructing facilities at as existing site (approximately 2 acres) at Gaviota to process the oil and gas for subsequent transportation; and
- Installing an ocean outfall pipeline terminating State waters to dispose of produced water extracted during onshore processing.

Texaco's proposed development includes:

- Installing two subsea oil and gas pipelines connecting Platform Harvest to Chevron's Platform Hermosa.

Chevron has designed its onshorefacilities to handle future production from the Point Arguello Field and other possible discoveries. Platform Hermosa will be the central platform for the area, designed to accommodate up to three future pipeline hookups, including Texaco's proposed platform on Harvest adjacent Lease OCS P- 0315 and Chevron's second platform, Hidalgo.

The common carrier pipeline is designed to accommodate the estimated combined production of all potential producers in the Southern Santa Maria Basin. A 30-inch pipeline will carry 200,000 barrels per day (BPD) of oil, and a 22-inch pipeline will transport 120 million standard cubic feet per day (MMSCFD) of gas from the producing platforms to shore facilities.

Offshore, the pipelines will be laid within a one-mile corridor and will follow a direct route, about 10 miles inlength, from the platform to a landfall on Chevron owned properyt just north of Point conception. From the landfall at Point Conception to Gaviota, the pipelines will run an additional 16 miles and will be laid in a 100-foot corridor along the Coast.

The new facilities will be installed in stages over a nine-year period as Arguello Field production increases. Because of the designated operational characteristics of the existing gas processing plant, Chevron plans to completely dismantle the existing facilities and reconstruct new equipment on a 23 acre parcel. The initial facilities are designed to treat 148,000 BPD of oil and 98 MMSCFD of gas. The ultimate capacity will be for 250,000 BPD of oil and 120 MMSCFD of gas. Approximately 50,000 barrels per day of wastewater will be discharged through an ocean outfall pipeline located in state waters in the vicinity of the Getty Gaviota marine terminal.

5. Las Flores Marine Terminal (LFT)

The proposed marine terminal is scheduled to be built in four phases, with a final average throughput capacity of 350,000 barrels of oil per day (BPD). Oil produced offshore will be piped onshore, stored at the terminal and transferred to tankers for shipment to refineries.

Proposed onshore LFT facilities will be located on 106 acres of property currently owned by Exxon in Corral Canyon, approximately 20 miles west of Santa Barbara. A pipeline/utility corridor will join onshore canyon facilities to offshore facilities, for transfer of crude. Offshore facilities consist of two single anchor leg moorings (SALMs) 6,000 to 8,000 feet offshore, for tanker loading.

Below is a summary of the final proposed LFT project which is to be constructed in four developmental phases:

- Five 500,000 barrel storage tanks for a total storage capacity of 2.5 million barrels.
- Industry serving electrical substation.
- Pump station in mouth of canyon.
- Pipeline/utility corridor connecting onshore storage facilities with offshore facilities.
- Southern California Edison transmission lines between Goleta and the mouth of Corral Canyon.
- Total acreage - 106 acres.

Offshore Facilities

- Two nearshore single anchor leg moorings (SALMs) 8,000 and 6,000 feet offshore in 175 and 170 feet of water to allow for simultaneous loading. (Anticipated size of tankers to be loaded = 26,000 to 300,000 dead weight tons.)
- Crude Loading System (CLS): pumps, motors and associated piping and equipment. Peak tanker loading rate of 100,000 barrels per hour.
- Offshore pipelines for oil, gas, power, and water.

Note: This proposal appears doubtful at the present time.

6. Arco - Coal Oil Point

- Expand the oil processing facility at Ellwood to accommodate increased production of 70,000 BPD of oil;

- Install a subsea power cable to supply electrical power to the platform complexes;

- Install subsea oil and gas pipelines from platform complexes to onshore facilities; and

- Construct a new gas processing plant at Eagle Canyon with processing capacity of 60 MMSCFD.

Oil treated at the existing Ellwood processing facility will be delivered through a proposed Four Corners Pipeline Company for shipment. Four Corners proposes to:

- Construct a common carrier pipeline (with capacity up to 150,000 BPD) from Ellwood to other pipelines existing the County and to an approved marine terminal, and

- Construct a pump station and two oil storage tanks at Dos Pueblos South.

In addition, Aminoil proposes to:

- Expand its marine terminal in Ellwood from 10,000 to 80,000 BPD to accommodate ARCO'S increased production.

7. Union Oil

Union proposes to:

- Offshore pipelines from Tract P-04411 to a landfall at Vandenberg Air Force Base, north of Surf, Ca.
- 14 acre oil processing facility (for heating, separation and pumping of oil) within Union's existing oil field north of Lompoc.
- Valve and booster pump station where onshore and offshore lines join at Vandenberg Air Force Base to control pipeline fluid flow rates.
- Electrical substation at Surf to supply power to the platform.
- Submarine power cable from the substation to platform.
- Oil shipping pipeline from proposed oil processing facility in Lompoc to Union's refinery near Nipomo.

Gas production associated with oil production at the processing facility will be transported through existing pipelines to Union Oil's existing Battles gas processing plant for treatment and sale.

8. Shell - Beta Field Development

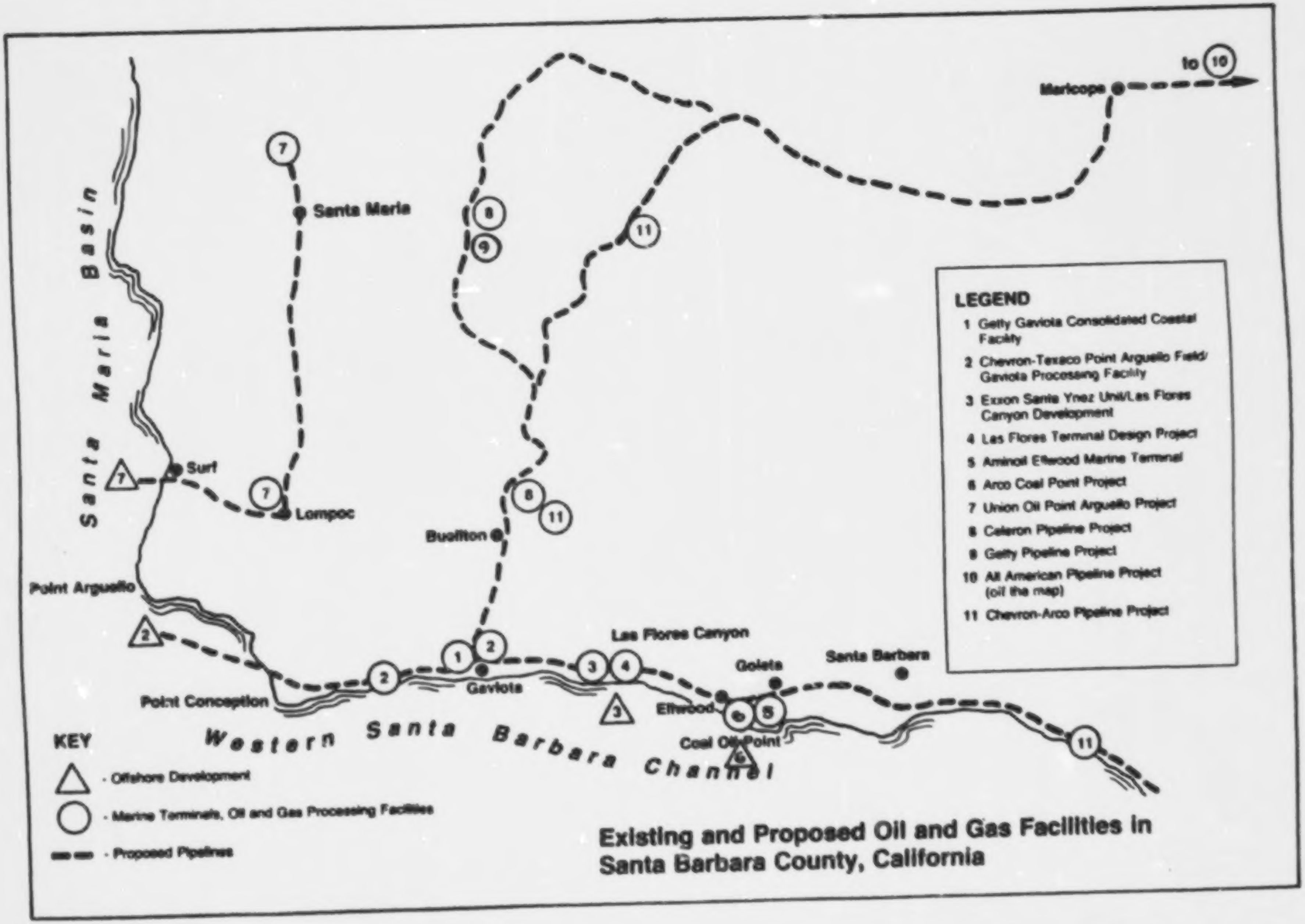
Shell proposes to:

- Connect platform Eureka to an existing platform Elly via a 12" dia. pipeline, a 10" water line, 6" gas line and two 35,000 v cables and then to shore via an existing 16" dia. oil line to Long Beach.
- No upgrade of the Long Beach is proposed since it is currently operating below capacity.

9. Chevron - Sockeye Field Development

Chevron proposes to:

- Connect platform Grace to an existing platform Gail via a pipeline and then to shore.


to 10
Maricopa
7
Santa Maria
8
9
11
Santa Maria Basin
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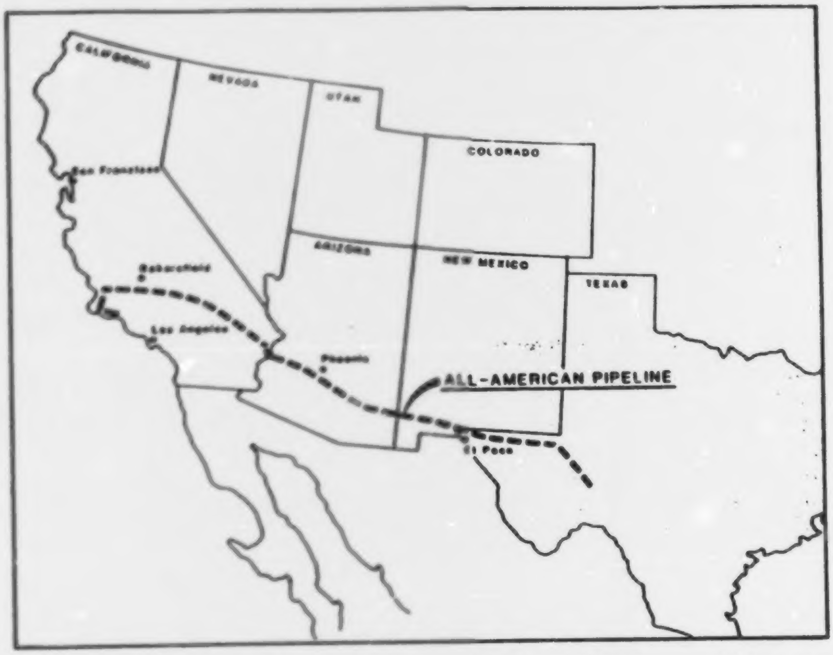
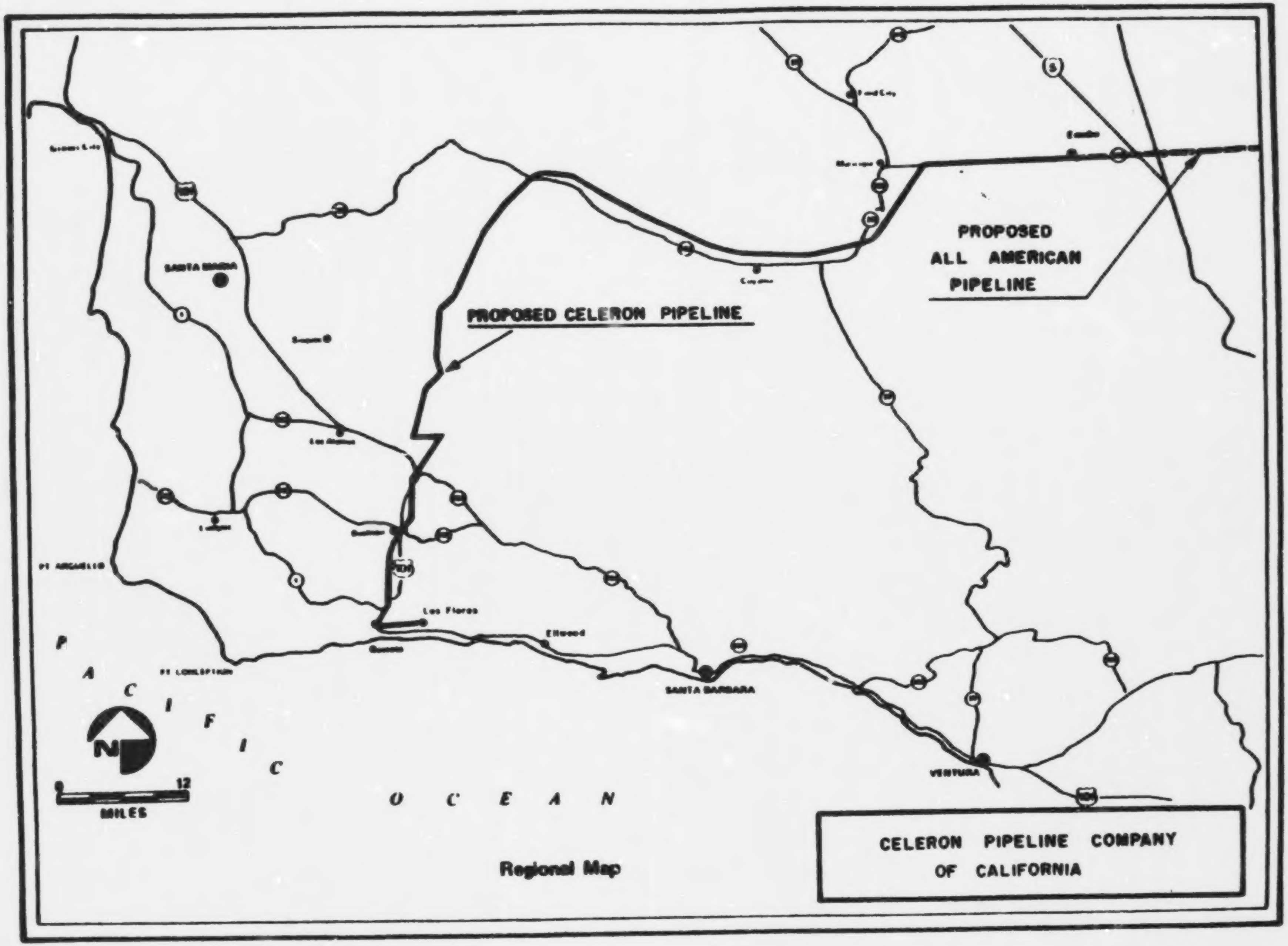
Surf
7
Lompoc
8
11
Buellton
Point Arguello
2
1
2
2
Point Conception
Gaviota
3
4
Las Flores Canyon
3
Ellwood
6
5
Coal Oil Point
6
Goleta
Santa Barbara
11
Western Santa Barbara Channel
LEGEND
1 Getty Gaviota Consolidated Coastal Facility
2 Chevron-Texaco Point Arguello Field/ Gaviota Processing Facility
3 Exxon Santa Ynez Unit/Las Flores Canyon Development
4 Las Flores Terminal Design Project
5 Aminoil Ellwood Marine Terminal
6 Arco Coal Point Project
7 Union Oil Point Arguello Project
8 Celeron Pipeline Project
9 Getty Pipeline Project
10 All American Pipeline Project (off the map)
11 Chevron-Arco Pipeline Project
KEY
△ - Offshore Development
○ - Marine Terminals, Oil and Gas Processing Facilities
▬ ▬ - Proposed Pipelines

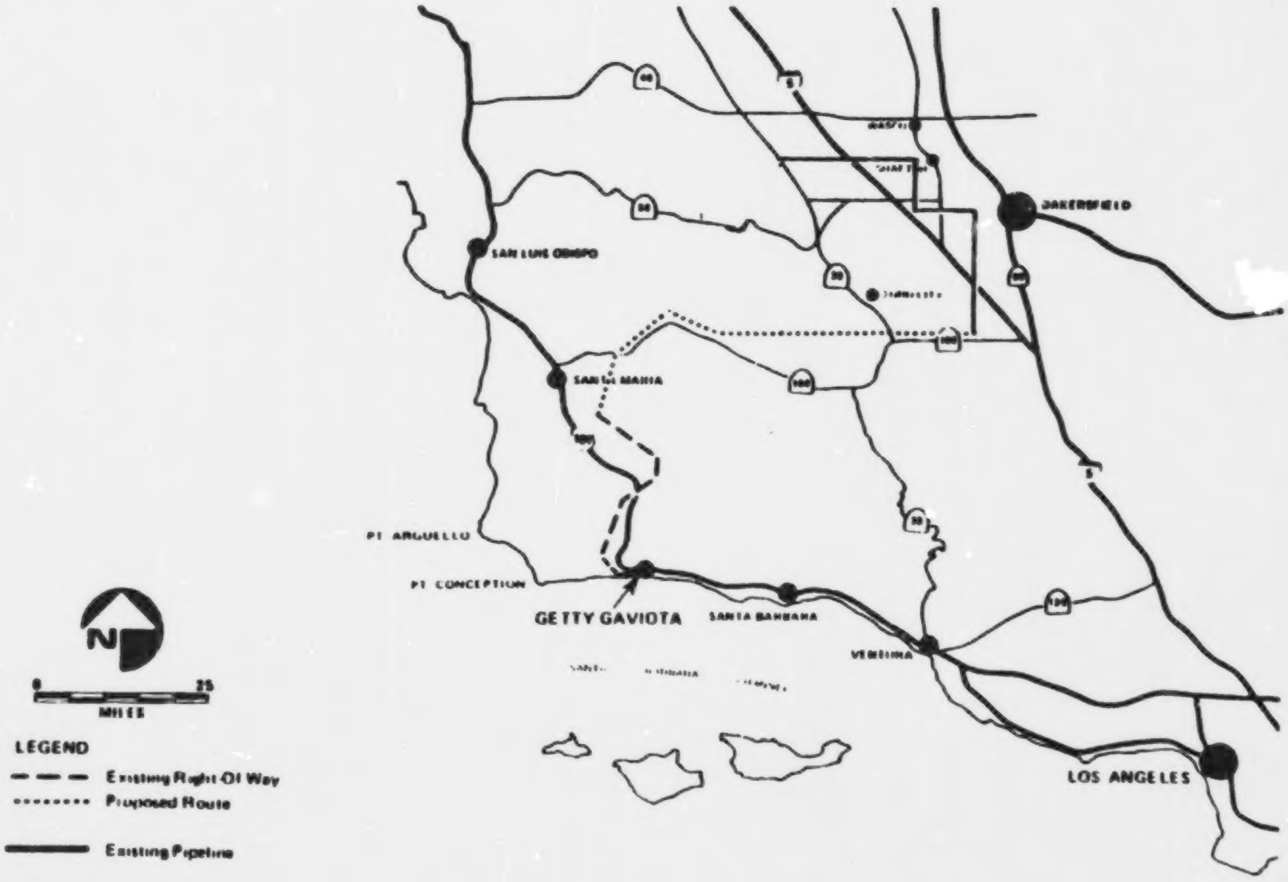
Existing and Proposed Oil and Gas Facilities in Santa Barbara County, California


CALIFORNIA
NEVADA
UTAH
COLORADO
San Francisco
Bakersfield
Los Angeles
ARIZONA
Phoenix
NEW MEXICO
TEXAS
ALL-AMERICAN PIPELINE
El Paso

ALL-AMERICAN PIPELINE. Construction is expected to begin in 1985 on the All-American Pipeline, a 1,200-mile pipeline to transport crude oil from the West Coast of California to West Texas for ultimate delivery to Gulf Coast and Mid-Continent refineries. The 30-in. diameter line, which will originate west of Santa Barbara, Calif., and will terminate in McCamey, Texas, could be completed by late 1986. All American Pipeline Co. awarded a turnkey contract for the project to American West Pipeline Constructors, a joint venture of Willbros Energy Services Co. and Gregory & Cook Inc.

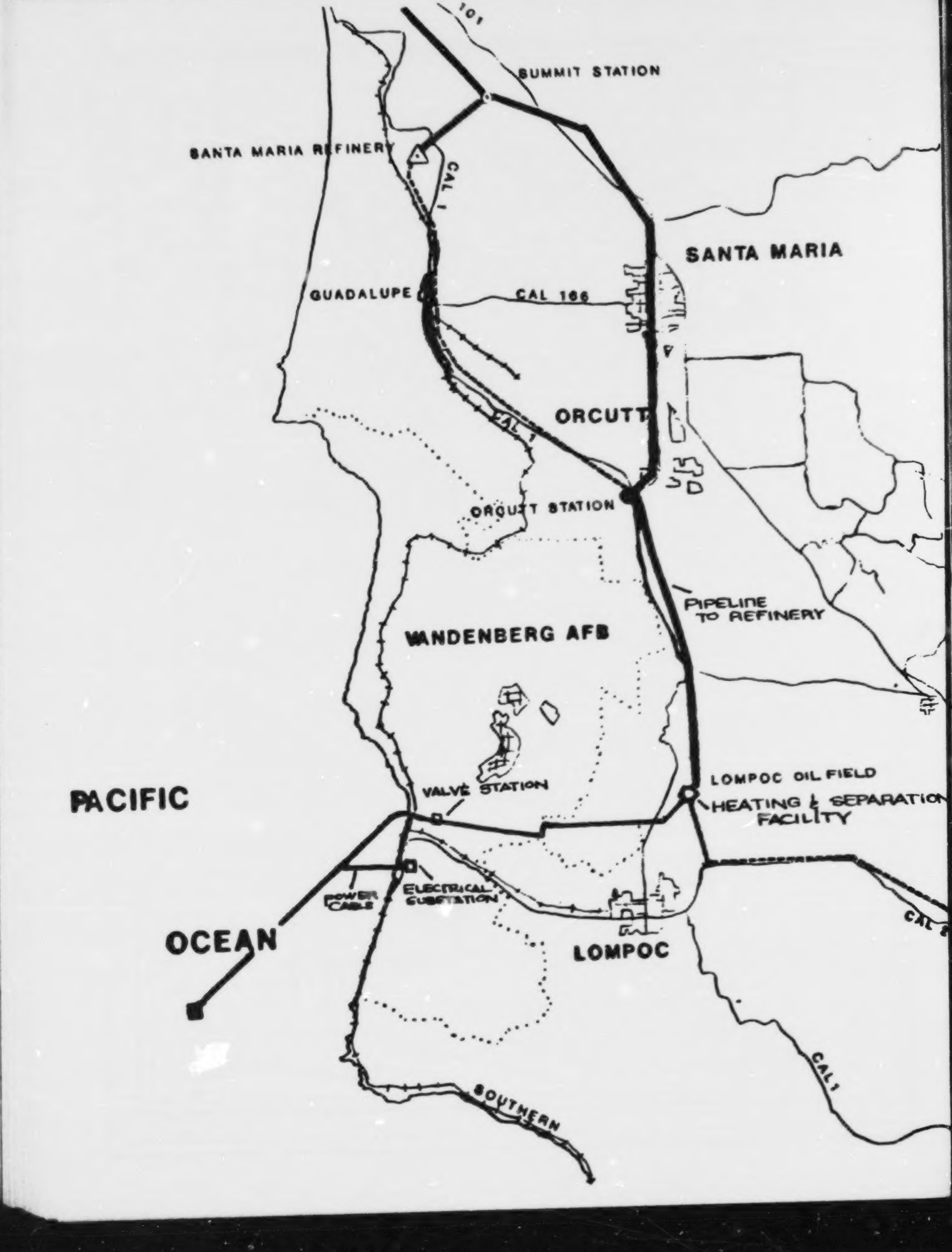

PROPOSED
ALL AMERICAN
PIPELINE
PROPOSED CELERON PIPELINE
PT ARGUELLO
PT CONCEPTION
Los Flores
Ellwood
SANTA BARBARA
VENTURA
P A C I F I C
O C E A N
N
0
12
MILES
CELERON PIPELINE COMPANY
OF CALIFORNIA

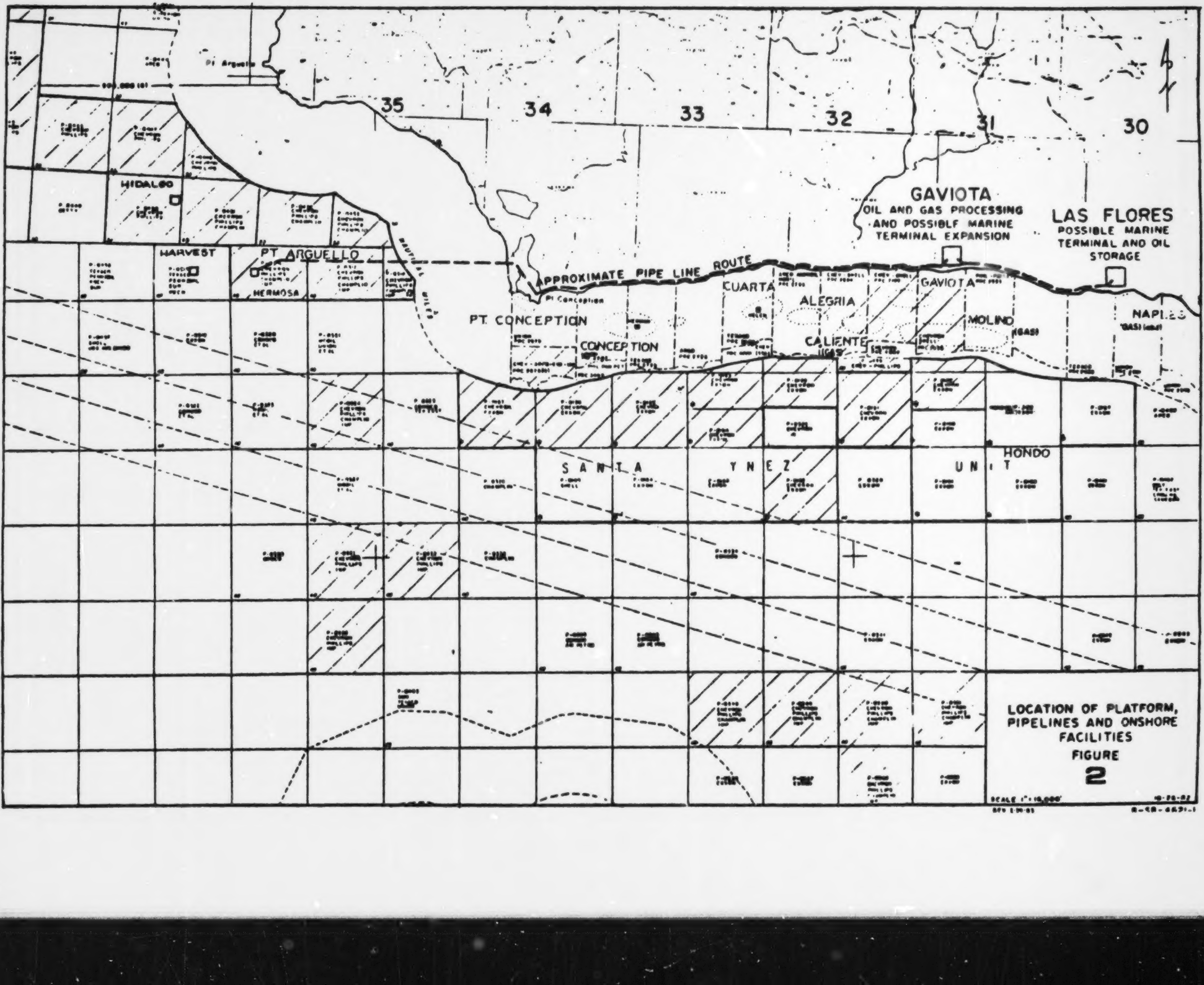
Regional Map


BAKERSFIELD
TAFT
SAN LUIS OBISPO
SANTA MARIA
PT ARGUELLO
PT CONCEPTION
GETTY GAVIOTA
SANTA BARBARA
VENTURA
LOS ANGELES
5
101
N
0
25
MILES
LEGEND
Existing Right-Of Way
Proposed Route
Existing Pipeline

Pipeline to Bakersfield

FIGURE 2-3


101
SUMMIT STATION
SANTA MARIA REFINERY
CAL 1
SANTA MARIA
GUADALUPE
CAL 166
ORCUTT
CAL 1
ORCUTT STATION
PIPELINE TO REFINERY
VANDENBERG AFB
LOMPOC OIL FIELD
HEATING & SEPARATIO
FACILITY
VALVE STATION
PACIFIC
OCEAN
POWER CABLE
ELECTRICAL SUBSTATION
LOMPOC
CAL
CAL 1
SOUTHERN


35
34
33
32
31
30
GAVIOTA
OIL AND GAS PROCESSING AND POSSIBLE MARINE TERMINAL EXPANSION
LAS FLORES
POSSIBLE MARINE TERMINAL AND OIL STORAGE
APPROXIMATE PIPE LINE ROUTE
Pt Arguello
Pt Conception
HIDALGO
HARVEST
PT ARGUELLO
HERMOSA
PT. CONCEPTION
CONCEPTION
CUARTA
ALEGRIA
CALIENTE
(GAS)
GAVIOTA
MOLINO
(GAS)
NAPLES
(GAS)
HONDO
SANTA YNEZ UNIT

LOCATION OF PLATFORM, PIPELINES AND ONSHORE FACILITIES

FIGURE 2

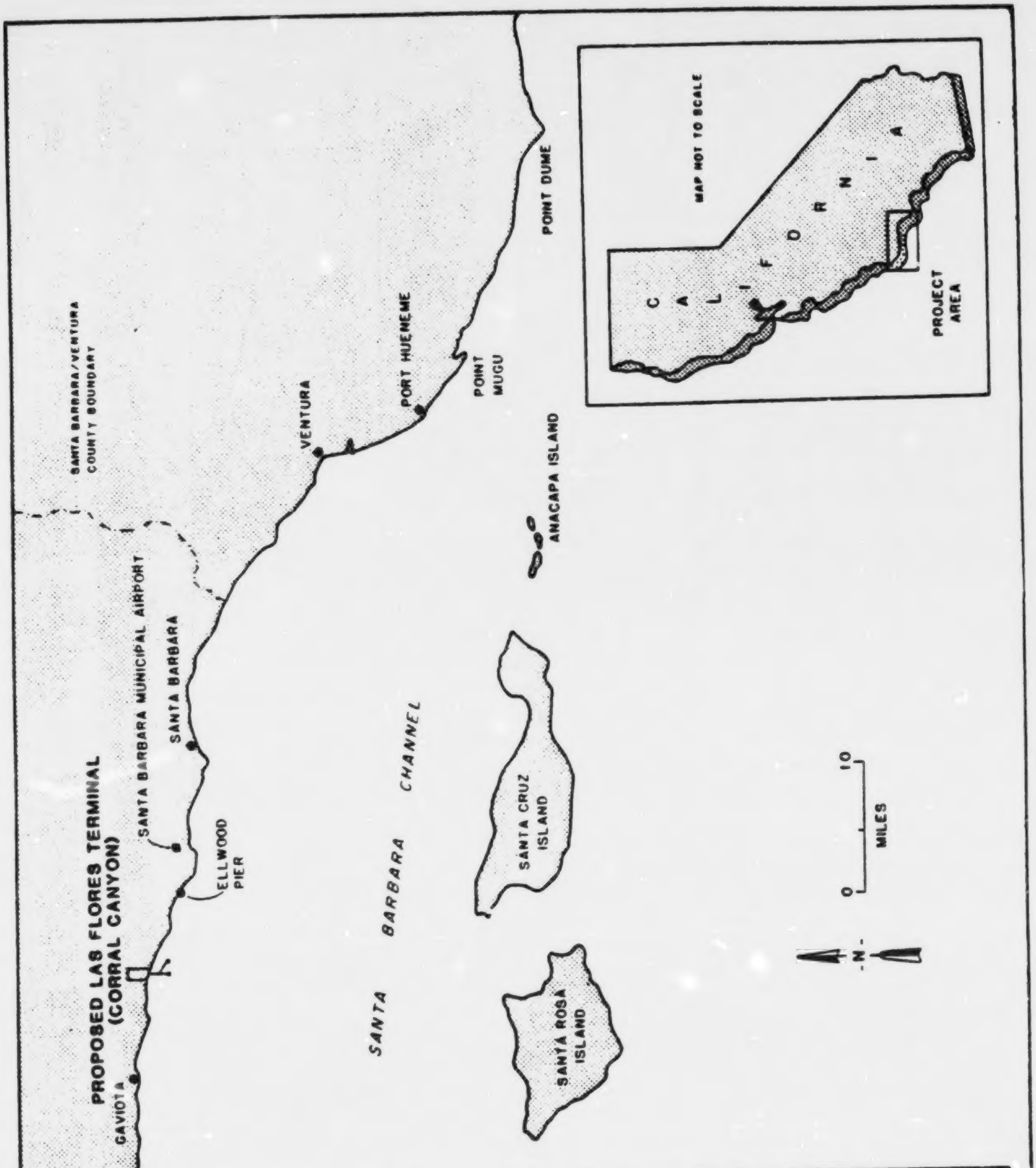
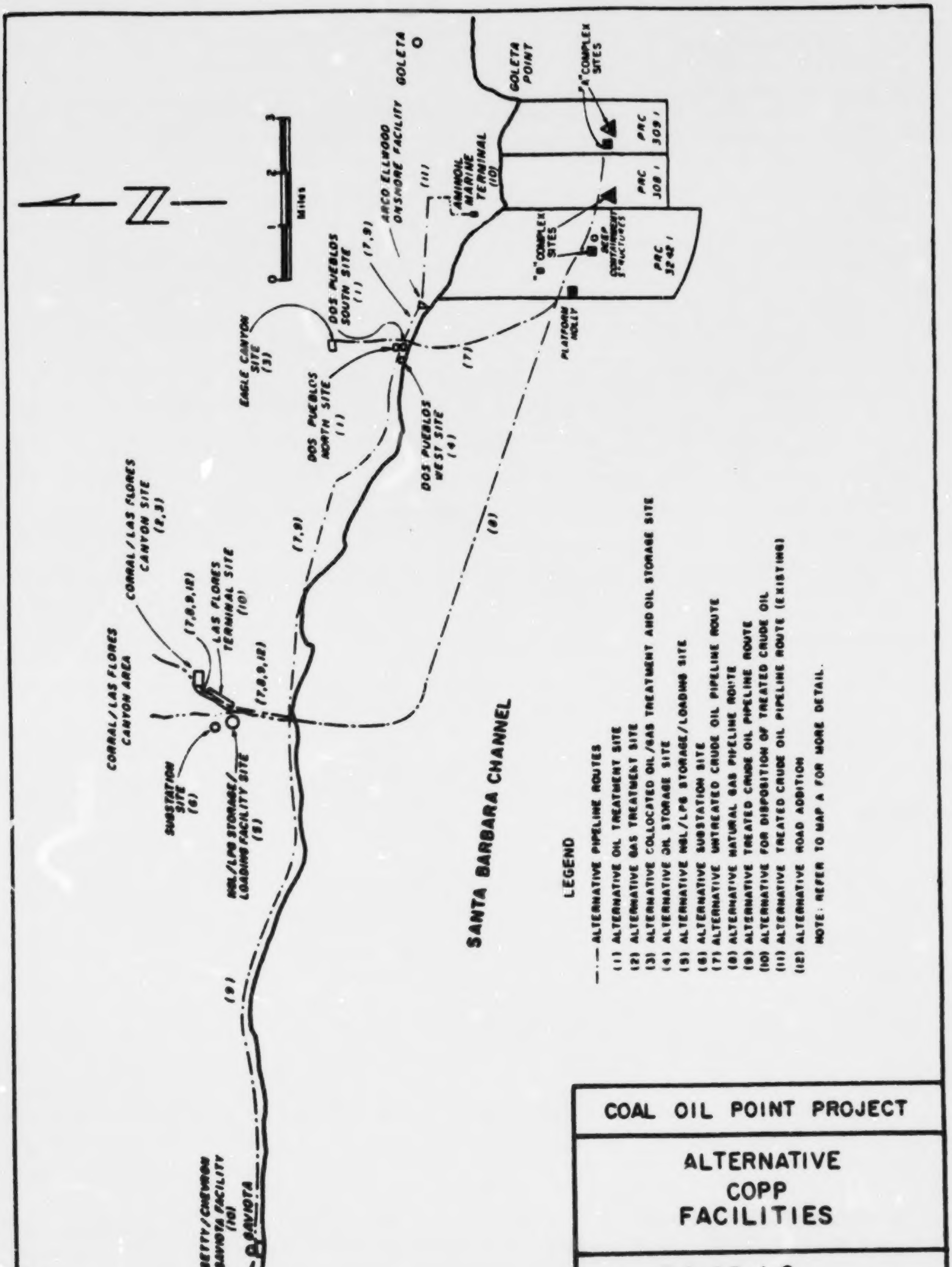

PROPOSED LAS FLORES TERMINAL (CORRAL CANYON)
POINT CONCEPTION
GAVIOTA
ELLWOOD PIER
SANTA BARBARA MUNICIPAL AIRPORT
SANTA BARBARA
SANTA BARBARA/VENTURA COUNTY BOUNDARY
VENTURA
PORT HUENEME
POINT MUGU
POINT DUME
SANTA BARBARA CHANNEL
SANTA ROSA ISLAND
SANTA CRUZ ISLAND
ANACAPA ISLAND
N
0
10
MILES
MAP NOT TO SCALE
C A L I F O R N I A
PROJECT AREA

FIGURE 1.1-2

LAS FLORES TERMINAL
REGIONAL SETTING


N
0 1 2 3
MILES
GOLETA
GOLETA POINT
"A" COMPLEX SITES
PRC 309.1
PRC 308.1
PRC 3242.1
AMINOIL MARINE TERMINAL (10)
(11)
ARCO ELLWOOD ONSHORE FACILITY
"B" COMPLEX SITES
DEEP CONTAINMENT STRUCTURES
PLATFORM HOLLY
(7,9)
DOS PUEBLOS SOUTH SITE (1)
EAGLE CANYON SITE (3)
DOS PUEBLOS NORTH SITE (1)
DOS PUEBLOS WEST SITE (4)
(7)
(8)
(7,9)
CORRAL/LAS FLORES CANYON SITE (2,3)
CORRAL/LAS FLORES CANYON AREA
(7,8,9,12)
LAS FLORES TERMINAL SITE (10)
(7,8,9,12)
SUBSTATION SITE (6)
NGL/LPG STORAGE/LOADING FACILITY SITE (5)
SANTA BARBARA CHANNEL
(9)
GETTY/CHEVRON GAVIOTA FACILITY (10)
GAVIOTA
LEGEND
— · — ALTERNATIVE PIPELINE ROUTES
(1) ALTERNATIVE OIL TREATMENT SITE
(2) ALTERNATIVE GAS TREATMENT SITE
(3) ALTERNATIVE COLLOCATED OIL/GAS TREATMENT AND OIL STORAGE SITE
(4) ALTERNATIVE OIL STORAGE SITE
(5) ALTERNATIVE NGL/LPG STORAGE/LOADING SITE
(6) ALTERNATIVE SUBSTATION SITE
(7) ALTERNATIVE UNTREATED CRUDE OIL PIPELINE ROUTE
(8) ALTERNATIVE NATURAL GAS PIPELINE ROUTE
(9) ALTERNATIVE TREATED CRUDE OIL PIPELINE ROUTE
(10) ALTERNATIVE FOR DISPOSITION OF TREATED CRUDE OIL
(11) ALTERNATIVE TREATED CRUDE OIL PIPELINE ROUTE (EXISTING)
(12) ALTERNATIVE ROAD ADDITION
NOTE: REFER TO MAP A FOR MORE DETAIL.

COAL OIL POINT PROJECT

ALTERNATIVE
COPP
FACILITIES

FIGURE 1-6

APPENDIX 'H'

PRELIMINARY REPORT

1982

CENSUS OF MANUFACTURES

(Issued July 1984 - U.S. Department of Commerce)

Industry 3533 includes establishments primarily engaged in the manufacture of oil field machinery. Also included is the manufacture of portable drilling rigs. Establishment data were tabulated based on industry definitions contained in the 1972 Standard Industrial Classification (SIC) Manual and its 1977 Supplement.[1]

The 1982 data included in this report are preliminary and, therefore, subject to change. These data will be superseded by a final paperbound report which, in turn, will be bound into Volume II, Industry Statistics, 1982 Census of Manufactures. The methods of data collection and use of administrative-record data are discussed in detail in the appendix.

Note: Effective with the 1982 Economic Censuses, uniform instructions for reporting inventories were introduced for all sector reports. Up to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, all respondents were requested to report inventories at cost or market. LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

This new instruction, which will eventually result in improved inventory data, has led to some confusion in the reporting of inventories. Because the 1982 data must be more closely evaluated, both the total end-of-year inventories and associated value added figures are suppressed in this preliminary publication. The final report series will contain these figures plus complete inventory detail by method of valuation. However, the inventory and value added figures for 1982 will not be comparable to prior-year data because of the change in reporting instructions described above.

* * *

The following abbreviations and symbols are used in the tables in this publication:

-	Represents zero.
(D)	Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
(NA)	Not available.
(NC)	Not comparable.
(S)	Withheld because estimate did not meet publication standards on the basis of either the response rate or a consistency review.
(X)	Not applicable.
(Z)	Less than half the unit shown.
n.e.c.	Not elsewhere classified.
n.s.k.	Not specified by kind.
pt.	Part.
r	Revised.
SIC	Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

---

[1] Standard Industrial Classification Manual: 1972. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 041-001-00066-6. 1977 Supplement. Stock No. 003-005-00176-0.

Table 1. Historical Statistics for the Industry: 1982 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendix]

Year[1]	Companies[2] (no.)	All establishments[3]		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)	Ratios	
		Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Specialization (percent)	Coverage (percent)
	INDUSTRY 3533, OIL FIELD MACHINERY														
1982 Census	881	1 005	499	99.2	2 348.0	60.3	120.6	1 299.4	(4)	4 792.5	11 218.0	908.0	(4)	92	98
1981 ASM	(NA)	(NA)	(NA)	95.0	2 189.2	64.3	133.9	1 333.3	7 514.4	5 066.3	11 872.8	701.0	3 533.3	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	79.1	1 616.5	52.9	109.8	995.1	4 918.0	3 261.9	7 789.8	462.1	2 408.2	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	71.8	1 293.7	48.1	97.2	790.1	3 726.8	2 476.0	5 955.1	375.0	1 887.6	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	66.9	1 145.3	46.5	97.9	696.4	3 147.0	2 192.9	5 030.5	264.3	1 622.5	(NA)	(NA)
1977 Census	386	478	247	58.6	867.5	39.8	83.4	543.3	2 437.6	1 493.4	3 912.4	257.5	1 212.5	88	95
1976 ASM	(NA)	(NA)	(NA)	57.3	804.7	38.1	80.7	483.7	2 057.9	1 317.7	3 282.5	195.0	1 164.3	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	54.8	719.7	37.4	81.3	444.5	2 014.3	1 194.6	3 063.1	182.9	1 061.4	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	50.1	593.9	34.0	73.0	366.5	1 502.1	871.8	2 183.3	158.7	804.0	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	38.9	416.7	25.6	54.2	254.4	934.9	600.5	1 457.5	58.2	488.1	(NA)	(NA)
1972 Census	257	315	159	35.9	357.5	24.3	49.9	217.3	788.6	463.6	1 213.0	54.7	382.2	82	93
1971 ASM	(NA)	(NA)	(NA)	35.9	318.0	24.0	48.7	190.0	677.4	377.3	1 052.8	38.4	325.5	(NA)	(NA)
1970 ASM	(NA)	(NA)	(NA)	38.6	323.0	26.0	54.0	197.4	686.0	383.0	1 057.2	41.2	316.0	(NA)	(NA)
1969 ASM	(NA)	(NA)	(NA)	36.9	292.5	24.7	52.3	179.2	622.0	372.3	989.2	37.3	299.5	(NA)	(NA)
1968 ASM	(NA)	(NA)	(NA)	34.6	266.3	23.4	49.1	161.3	560.3	348.8	906.1	30.7	277.7	(NA)	(NA)
1967 Census	309	360	174	32.7	240.4	21.7	46.1	143.4	502.9	305.3	799.8	23.7	257.6	85	92

[1] In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1967, see 1967 Census of Manufactures, vol. II, table 1 of the Industry chapter.

[2] For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

[3] Includes establishments with payroll at any time during year.

[4] 1982 data for inventories and value added are suppressed in this preliminary report. See text for explanation.

Table 2. Industry Statistics for Selected States: 1982 and 1977

[Excludes data for auxiliaries. Includes data for States with 500 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendix]

Geographic area	1982												1977	
	E[1]	All establishments[2]		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees[3] (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number[3] (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3533, OIL FIELD MACHINERY														
United States	-	**1 005**	**499**	**99.2**	**2 348.0**	**60.3**	**120.6**	**1 299.4**	(4)	**4 792.5**	**11 218.0**	**908.0**	**58.6**	**2 437.6**
California	-	73	42	12.6	311.6	6.6	13.0	147.8	(4)	534.0	1 595.2	123.6	6.6	377.1
Colorado	E2	19	9	.6	11.7	.3	.6	6.3	(4)	42.0	64.8	2.8	(NA)	(NA)
Kansas	-	16	6	1.1	19.5	.8	1.5	12.0	(4)	41.8	91.5	3.3	.7	19.6
Louisiana	-	84	40	4.1	93.2	3.0	5.5	54.3	(4)	142.2	367.3	52.6	1.7	66.8
Ohio	E1	19	10	.5	10.6	.3	.6	4.6	(4)	26.1	50.7	6.1	BB	(D)
Oklahoma	-	131	60	9.4	202.6	6.4	12.7	128.0	(4)	496.5	956.6	63.4	5.6	198.8
Pennsylvania	-	13	11	1.9	48.3	1.3	2.1	24.3	(4)	76.2	210.9	6.8	2.3	62.2
Texas	-	535	277	64.6	1 556.7	38.8	79.1	869.0	(4)	3 254.8	7 462.4	630.7	39.8	1 632.5
Washington	-	3	2	CC	(D)	(D)	(D)	(D)	(4)	(D)	(D)	(D)	(NA)	(NA)

[1] Payroll, employment, and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown for those States where estimated data based on administrative-record data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

[2] Includes establishments with payroll at any time during year.

[3] Statistics for some producing States have been withheld to avoid disclosing data for individual companies and to permit further verification of data for smaller States. Data for all States with 150 manufacturing employees or more will be included in final publication if figures do not disclose data for individual companies. The following employee size ranges substitute for actual figures withheld to avoid disclosure: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more.

[4] 1982 data for value added are suppressed in this preliminary report. See text for explanation.

Table 3. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of $100,000 or more	Product shipments[1]		Number of companies with shipments of $100,000 or more	Product shipments[1]	
			Quantity[2]	Value (million dollars)		Quantity[2]	Value (million dollars)
	OIL FIELD MACHINERY						
3533- —	**Total**	**(NA)**	**(X)**	**9 497.6**	**(NA)**	**(X)**	**3 219.4**
35331 —	Rotary oil field and gas field drilling machinery and equipment	(NA)	(X)	3 799.5	(NA)	(X)	1 221.4
	Rotary drilling surface equipment:						
35331 11	Blocks, crown and traveling ... number	10	(S)	44.2	7	336	7.7
35331 12	Draw works and accessories ... do.	27	(S)	210.9	11	306	43.8
35331 14	Rotary tables ... do.	10	(S)	42.7	5	376	9.3
35331 15	Elevators, spiders, slips, hooks, links, and connectors	17	(X)	291.6	8	(X)	66.9
35331 16	Swivels and accessories	16	(X)	69.4	10	(X)	14.7
35331 17	Well control equipment (blow-out preventers, etc.)	26	(X)	768.1	13	(X)	233.1
35331 21	Other rotary drilling surface machinery and equipment, including Kelly joints	30	(X)	276.4	17	(X)	[5]59.3
	Rotary drilling subsurface equipment:						
35331 41	Bits ... thousands	16	[4]444.4	1 033.8	11	450.8	424.0
35331 46	Reamers and stabilizers	11	(X)	88.2	6	(X)	(5)
35331 43	Coring equipment	6	(X)	13.9	5	(X)	7.0
35331 44	Tool joints, subs, and connectors	20	(X)	410.2	12	(X)	120.5
35331 45	Drill collars ... thousands	12	(S)	162.2	6	21.0	59.2
35331 47	Fishing and cutting tools	16	(X)	143.3	10	(X)	58.5
35331 48	Subsea drilling risers ... number	3	(X)	209.0	16	(X)	[5]61.2
35331 59	Other subsurface rotary drilling equipment	17					
35331 00	Rotary oil field and gas field drilling machinery and equipment, n.s.k.	(NA)	(X)	35.7	(NA)	(X)	36.2
35332 —	Other oil field and gas field drilling machinery and equipment	(NA)	(X)	836.4	(NA)	(X)	208.3
35332 31	Cable tool drilling machinery and equipment, including both surface and subsurface equipment	2	(X)	(4)	2	(X)	(4)
	Cementing, floating, guiding, and shoe equipment:						
35332 51	Guide shoes, float collars, and combination guide and float shoes	15	(X)	86.5	6	(X)	16.9
35332 55	Other cementing equipment	16	(X)	78.7	6	(X)	14.8
35332 61	Parts for oil and gas field drilling equipment sold separately, except parts for portable drilling rigs	38	(X)	518.8	20	(X)	109.1
35332 98	Other oil and gas field drilling equipment, except portable	21	(X)	[4]142.3	15	(X)	[4]65.9
35332 00	Other oil field and gas field drilling machinery and equipment, n.s.k.	(NA)	(X)	10.0	(NA)	(X)	1.5
35333 —	Oil field and gas field production machinery and equipment (except pumps)	(NA)	(X)	3 007.0	(NA)	(X)	[6]1 110.5
	Production well equipment, surface, subsurface, and subsea:						
35333 12	Christmas tree assemblies, excluding subsea	11	(X)	228.1	8	(X)	[6]95.2
35333 13	Casing and tubing heads and supports	18	(X)	213.3	14	(X)	117.2
35333 14	Chokes, manifolds, and other accessories (excluding subsea manifolds and templates)	20	(X)	104.6	13	(X)	[6]39.0
35333 19	Rodless oil lifting machinery and equipment (except pumps)	9	(X)	138.5	5	(X)	39.1
35333 21	Subsea Christmas tree assemblies, manifolds, and templates	6	(X)	50.9	(NA)	(X)	(6)
	Rod lifting machinery and equipment, surface, including pumps when they are components of a complete assembly:						
35333 53	Pumping units and accessories, including back crank equipment ... thousands	31	(NA)	412.8	12	8.1	167.1
35333 55	Other surface rod lifting machinery and equipment	3			3	(X)	(7)
35333 57	Subsurface rod lifting equipment (sucker rods), except pumps ... 1,000 sucker rods	12	[8]4 989.7	198.0	5	14 365.7	71.4
	Other production machinery and equipment:						
35333 61	Packers	14	(X)	384.9	11	(X)	121.6
35333 65	Screens, tubing, catchers, etc.	10	(X)	33.7	6	(X)	22.9
35333 71	Oil and gas separating, metering, and treating equipment ... 1,000 separators	32	(S)	226.1	18	(S)	90.3
35333 82	Parts for oil and gas field machinery and tools, sold separately, excluding parts for portable drilling rigs and other drilling equipment	50	(X)	134.7	20	(X)	[6]53.2
35333 98	Other oil and gas field production machinery and tools	58	(X)	850.9	41	(X)	[7]285.3
35333 00	Oil field and gas field production machinery and equipment (except pumps), n.s.k.	(NA)	(X)	30.5	(NA)	(X)	8.1

See footnotes at end of table.

Table 3. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of $100,000 or more	Product shipments[1] Quantity[2]	Product shipments[1] Value (million dollars)	Number of companies with shipments of $100,000 or more	Product shipments[1] Quantity[2]	Product shipments[1] Value (million dollars)
	OIL FIELD MACHINERY—Con.						
35335 —	Portable drilling rigs	(NA)	(X)	553.4	(NA)	(X)	[8]366.8
35335 10	Portable drilling rigs (mounted and unmounted) used on the surface (above ground):						
	As reported in the census of manufactures	36	(X)	436.5	(NA)	(X)	[8]366.8
	As reported in the Current Industrial Report MA-35F, Mining Machinery and Mineral Processing Equipment	(NA)	(X)	'431.6	(NA)	(X)	[9]378.4
	Portable drilling rigs with pull-back capacity (water well, mineral exploration, shallow oil, and gas):						
35335 11	Cable tool (all sizes) number	(NA)	([10])	([10])	(NA)	[9]2537	[9]378.4
35335 13	Reverse circulation (16 in. or larger) do.	(NA)	([10])	([10])			
	Rotary—trailer and truck mounted with pull-back capacity:						
35335 21	Up to 14,999 lb do.	(NA)	112	2.8			
35335 23	15,000 to 29,999 lb do.	(NA)	87	17.3			
35335 25	30,000 to 59,999 lb do.	(NA)	154	37.9			
35335 27	60,000 to 74,999 lb do.	(NA)	70	22.0			
35335 29	75,000 lb or more do.	(NA)	75	43.9			
	Blasthole drills, rotary:						
	Truck mounted:						
35335 31	Up to 29,999 lb do.	(NA)	-	-			
35335 33	30,000 to 59,999 lb do.	(NA)	([11])	([11])			
35335 35	60,000 lb and over do.	(NA)	[11]53	[11]15.9			
	Track mounted:						
35335 37	Up to 29,999 lb do.	(NA)	95	12.9			
35335 38	30,000 to 59,999 lb do.	(NA)	94	24.4			
35335 39	60,000 lb or more do.	(NA)	39	34.4			
	Construction drills:						
35335 41	Bucket drills do.	(NA)	([12])	([12])			
35335 43	Auger drills do.	(NA)	[12]155	[12]9.2			
35335 49	All other portable drilling rigs, not specified above (including unmounted drills) do.	(NA)	[10]186	[10]33.6			
35335 0A	Portable drilling rigs, n.s.k.	(NA)	(X)	177.4	(NA)	(X)	-
35335 78	Parts for portable drilling rigs used on the surface (above ground)	36	(X)	116.9	(NA)	(X)	([8])
35335 00	Portable drilling rigs, n.s.k.	(NA)	(X)	([13])	(NA)	(X)	([13])
35336 —	Oil field and gas field derricks and well surveying machinery	(NA)	(X)	716.4	(NA)	(X)	133.9
35336 21	Derricks, oil and gas field, substructures, and accessories—regular and portable number	30	(S)	422.6	12	(S)	48.3
35336 31	Well surveying machinery and equipment	25	(X)	277.5	7	(X)	76.3
35336 00	Oil field and gas field derricks and well surveying machinery, n.s.k.	(NA)	(X)	[13]16.3	(NA)	(X)	[13]9.3
35330 00	Oil field machinery, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	403.3	(NA)	(X)	93.2
35330 02	Oil field machinery, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	181.6	(NA)	(X)	65.4

Note: In 1982 Census of Manufactures, data for establishments of small single-unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoff used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1982 and 1977 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

---

[1] Data reported by all producers, not just those with shipments of $100,000 or more.

[2] For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

[3] For 1977, Kelly joints, reamers and stabilizers, and subsea drilling risers were included in product code 35331 59. For 1977, the company count for product code 35331 46 excluded stabilizers.

[4] For 1982 and 1977, product code 35332 31 was included with product code 35332 98 to avoid disclosing data for individual companies.

[5] For 1977, product class 35333 and product code 35333 82 included parts for portable drilling rigs used on the surface (above ground).

[6] For 1977, subsea christmas tree assemblies and subsea manifolds and templates were included in product codes 35333 12 and 35333 14.

[7] For 1977, product code 35333 55 was included with product code 35333 98 to avoid disclosing data for individual companies.

[8] For 1977, product class 35335, portable drilling rigs, as reported in the census of manufactures, excluded parts for portable drilling rigs used on the surface (above ground), and portable drilling rigs, n.s.k.

[9] For 1977, cable and rotary oil field and gas field portable drilling rigs were included, but were collected only in the census of manufactures.

[10] For 1982, product codes 35335 11 and 35335 13 were included with product code 35335 49 to avoid disclosing data for individual companies.

[11] For 1982, product code 35335 33 is included with product code 35335 35 to avoid disclosing data for individual companies.

[12] For 1982, product code 35335 41 is included with product code 35335 43 to avoid disclosing data for individual companies.

[13] For 1982 and 1977, product code 35335 00 was included product code 35336 00.

Table 4. Materials Consumed by Kind: 1982 and 1977

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity[1]	Delivered cost (million dollars)	Quantity[1]	Delivered cost (million dollars)
	INDUSTRY 3533, OIL FIELD MACHINERY				
	Materials, parts, containers, and supplies	(X)	3 720.1	(X)	1 293.8
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes .... 1,000 s tons..	(S)	184.1	*119.3	65.3
331013	Plates .... do..	(S)	69.8	**74.5	29.2
331015	Structural shapes .... do..	(S)	58.5	*86.4	24.4
331054	All other alloy steel mill shapes and forms .... do..	(S)	65.3	(S)	65.6
	Alloy steel, except stainless:				
331021	Bars and bar shapes .... do..	(S)	363.8	*172.4	92.8
331029	All other alloy steel mill shapes and forms .... do..	(S)	85.5	(S)	90.7
	Stainless steel:				
331033	Sheet and strip .... do..	(S)	104.9	*1.3	2.7
331050	All other stainless steel mill shapes and forms .... do..			(S)	31.0
335105	Copper and copper-base alloy .... million lb..	(S)	4.8	2.3	2.7
335001	Aluminum and aluminum-base alloy .... do..	(S)	8.0	1.3	1.8
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased .... 1,000 s tons..	(S)	170.9	29.1	33.7
	Produced and consumed .... do..	2.3	(X)	(S)	(X)
332045	Steel:				
	Purchased .... do..	(S)	237.8	46.1	77.7
	Produced and consumed .... do..	.7	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased .... million lb..	(S)	5.1	(X)	([3])
	Produced and consumed .... do..	-	(X)	(X)	(X)
336200	Copper and copper-base alloy:				
	Purchased .... do..	(D)	(D)	(S)	3.0
	Produced and consumed .... do..	(Z)	(X)	(S)	(X)
339902	Other nonferrous:				
	Purchased .... do..	(S)	(D)	(X)	([3])
	Produced and consumed .... do..	-	(X)	(X)	(X)
339915	Metal powders .... do..	(S)	56.1	(S)	18.2
346200	Iron and steel forgings:				
	Purchased .... 1,000 s tons..	(S)	226.6	48.0	57.4
	Produced and consumed .... do..	39.7	(X)	(S)	(X)
351920	Engines, diesel and semidiesel:				
	Purchased .... thousands..	**4.9	75.8	4.8	47.8
	Produced and consumed .... do..	(Z)	(X)	(S)	(X)
	Bearings:				
356218	Ball	(X)	16.0	(X)	4.8
356201	Rollers	(X)	36.7	(X)	13.8
356810	Plain bearings and bushings	(X)	9.1	(X)	1.6
356601	Speed changers, drives, gears, and industrial high speed drives	(X)	18.5	(X)	11.6
	Electric motors and generators:				
362115	Fractional horsepower electric motors (under 1 hp), excluding timing motors:				
	Purchased .... thousands..	(S)	1.3	(X)	([4])
	Produced and consumed .... do..	-	(X)	(X)	(X)
362120	Integral horsepower electric motors and generators (1 hp and over):				
	Purchased .... do..	(S)	27.0	(X)	[4]14.8
	Produced and consumed .... do..	(Z)	(X)	(X)	(X)
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets	(X)	39.2	(X)	17.7
307902	Fabricated plastics products, except gaskets	(X)	6.8	(X)	4.0
	Valves:				
349421	Fluid power (hydraulic and pneumatic)	(X)	38.7	(X)	([5])
349404	All other	(X)	63.8	(X)	[5]40.4
349461	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies	(X)	13.9	(X)	([3])
354501	Cutting tools for machine tools	(X)	46.6	(X)	15.6
	Pumps (complete assemblies):				
356120	Hydraulic fluid power pumps, motors, and hydrostatic transmissions .... thousands..	(S)	25.3	(X)	([3])
356102	Other pumps .... do..	(S)	37.9	(X)	([3])
356921	Filters for hydraulic fluid power systems	(X)	2.2	(X)	([3])
359621	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators	(X)	15.5	(X)	([3])
353301	Parts and attachments for oil and gas field machinery and equipment	(X)	217.2	(X)	([3])
970099	All other materials and components, parts, containers, and supplies	(X)	762.5	(X)	[3]366.1
971000	Materials, parts, containers, and supplies, n.s.k.[2]	(X)	607.8	(X)	119.8

[1] For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

[2] Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

[3] For 1977, material codes 336100, 339902, 349461, 356120, 356102, 356921, 359621, and 353301 were included with material code 970099.

[4] For 1977, material code 362115 was included with material code 362120. The 1977 figure included parts.

[5] For 1977, material code 349421 was included with material code 349404; pipe fittings (except plumbers' brass goods and fittings) were also included in the 1977 figure.

APPENDIX

Scope and Coverage and Explanation of Terms

GENERAL

The 1982 Census of Manufactures is the 31st census of manufacturing establishments in the United States. For 1982, it was conducted as part of the economic censuses, which also included the censuses of mineral industries, construction industries, retail trade, wholesale trade, and service industries, under authority of title 13 of the United States Code. Title 13 specifies that an economic census be conducted every 5 years to cover years ending in 2 and 7.

SCOPE AND COVERAGE

Establishment Basis of Reporting

The census of manufactures is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. All manufacturing establishments with one or more paid employees at any time during the year are covered by the census of manufactures; establishments without employees are excluded from this census. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units which service manufacturing establishments of the same company. Where these auxiliary operations are conducted at the same location as the manufacturing operation, they are usually included in the report for the operating manufacturing establishment.

Use of Administrative Records

From a universe of approximately 350,000 manufacturing establishments in the 1982 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of the small establishment nonmail cases was done on an industry-by-industry basis. A variable cutoff was used to determine those establishments for which administrative records were to be used in place of a census report. The cutoffs were selected so the administrative record cases would account for approximately 3 percent of the value of shipments for the industry. These cutoffs were then adjusted so that all single-establishment companies with less than 5 employees were excluded from the mail canvass, while all establishments with more than 20 employees were included. Where establishments in the 5 to 20 employee size range were included in the mail canvass, an abbreviated census form was frequently used.

For these nonmail establishments, (and a small number of larger establishments whose reports were not received at the time the data were tabulated) data on employment, payroll, and receipts were obtained from administrative records of other government agencies rather than from census forms. The administrative record information was then used in conjunction with industry averages to estimate the data for these establishments. The value of shipments and cost of materials were not distributed among specific products and materials but were included in the product and material "not specified by kind" categories.

EXPLANATION OF TERMS

All employees—This item includes all full-time and part-time employees on the payrolls at any time during the year. Included are all persons on paid sick leave, paid holidays, and paid vacations. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average of those for midmonth payroll periods of March, May, August, and November.

Payroll—This item includes all forms of compensation for the "employees" defined above such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. Respondents were told that in reporting they could follow the definition of payrolls used for calculating the Federal withholding tax.

Production-worker hours—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the plant.

Cost of materials—This item refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuels consumed, regardless of whether they were purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (a) all raw materials, semifinished goods, parts, components, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year; (b) electric energy purchased; (c) fuels consumed for heat, power, or generating electricity; (d) work done by others on materials or parts furnished by manufacturing establishments (contract work); and (e) products bought and resold in the same condition.

Specific materials consumed (table 4)—In addition to the total cost of materials which every establishment was required to report, information was also collected for many manufacturing industries on the consumption of major materials used in manufacturing. These inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Establishments consuming less than a specified amount (usually $10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which administrative records were used were imputed as "not specified by kind."

Value of shipments—This item refers to received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts such as receipts for contract work performed for others, installation and repair, sales of scrap, and sale of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it whether sold, transferrred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferrred to other establishments of the same company at full economic or commercial value, i.e., including not only the direct costs of production but also a reasonable proportion of "all other costs" (including company overhead and profit).

Shipments of individual products (table 3)—In the 1982 census, detailed shipment information was collected on the output of approximately 13,000 individual products. These products are identified by a seven-digit code and are grouped into approximately 1,300 classes of products, which in turn are primary to about 450 four-digit industries. Data at the five-digit product-class level have been collected each year as part of the annual survey of manufactures. Information at the seven-digit level, collected for many industries in the current industrial reports program, are also included in this table.

Value added by manufacture—This measure of manufacturing activty is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments. The result of this calculation is then adjusted by the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

"Value added" avoids the duplication in the figure for value of shipments which results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

Expenditures for new plant and equipment—For establishments in operation and establishments under construction but not yet in operation, manufacturers were asked to report their expenditures for (a) permanent additions and major alterations to manufacturing establishments and (b) new machinery and equipment used for replacement and additions to plant capacity if they are of the type for which depreciation accounts are ordinarily maintained.

These totals exclude expenditures for used plant and equipment, expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

End-of-year inventories—Beginning in 1982, respondents were asked to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Although the change in inventories between years is of considerably greater significance than the measurement of the level of inventories, 1982 data for inventories are not strictly comparable to prior year data.

Specialization and coverage ratios—An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry. An establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). The following ratios have been developed to measure the relationship of primary product shipments to (a) the data on shipments for the industry shown in tables 1 and 2, and (b) data on product shipments shown in table 3:

Specialization ratio—This item represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio—This item represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments, wherever classified.

APPENDIX 'I'

SUMMARY OF RESPONSE BY CANADIAN MANUFACTURERS

BY

EQUIPMENT CATEGORY

The following schedule gives listings of Canadian companies with general interest in the products identified plus some indication of present U.S.A. (California) trading activities.

Manufacturer responses have been grouped into the following broad categories.

EQUIPMENT CATEGORIES

1. Drilling equipment
2. Consulting services
3. Process/production equipment
4. Downhole tools, completion and workover equipment
5. Tubulars
6. Safety/environmental protection equipment
7. Electrical instrumentation and communication equipment
8. Drilling and production support equipment
9. Miscellaneous/platform support equipment

SUMMARY OF RESPONSES

List Total Responses:	174
Total Canadian Owned Companies:	111
Total Canadian Owned Companies Trading U.S.A.:	60
Total Canadian Owned Companies Trading California:	11

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
1. DRILLING EQUIPMENT						
Accumulators (B.O.P. Systems)	Four M Oilfield Services Ltd.	x				x
	Wagner Oilfield Ltd.	x	x	x		x
	Koomey Control Systems of Canada Ltd.				x	x
Bits - Diamond Drilling and Core	Canadian Diamant Boart Ltd.					
	Trend Rock Bit International Ltd.	x				x
- Tungsten Carbide	Canadian Diamant Boart Ltd.					
	Canadian Strata Drill Ltd.					
- Tri-Cone	Walker McDonald Bits Ltd.					
- Protectors	Chimo Production Ltd.	x				x
Brakes (drawworks)	Tri-Service Oilfield Mfg. Ltd.					
	Kobelt Manufacturing Co. Ltd.	x	x			x
Casing Bowls	Barler Industries					
	Alberta Walker Wellhead Ltd.					
	Stream Flo Industries Ltd.					
Cementing Equipment	Nowsco Well Services Ltd.	x	x			x
	Canadian Fracmaster ltd.	x				x
	Dyer Equipment Mfg. Inc.	x	x			x
Chokes - Drilling	G.B. Master Flo Valve Corpn Ltd.	x	x			x
Cyclones - (Mud Systems)	Chimo Production Ltd.	x				x
	Schiffner Oilfield Company Ltd.					
Degassers	Flo-Rite Industries Ltd.					
	Schiffner Oilfield Company Ltd.					
	Wagner Oilfield Mfg. Ltd.	x	x	x		x
Derricks and Masts	Dreco Ltd.					
	Rudd and Hodgson Industries Ltd.					
Desilters	Maloney Steel Ltd.	x				x
Desanders	Desalinators - Koomey Control Systems				x	x
	- Seagold Industries Corp.	x				x
	Chimo Production Ltd.	x				x
	Flo-Rite Industries Ltd.					
	Schiffner Oilfield Company Ltd.					
	Wagner Oilfield Mfg. Ltd.	x	x	x		x
Desilters	Chimo Production Ltd.	x				x
	Flo-Rite Industries Ltd.					
	Schiffner Oilfield Company Ltd.					
	Wagner Oilfield Mfg. Ltd.	x	x	x		x

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
Drawworks	Superior Oilwell Mahcinery Ltd.					
	Troy Equipment of Canada					
	Tri-Service Oilfield Mfg. Ltd.					
	Griffith Oil Tool Co. Ltd.				x	x
	Mainland Manufacturing	x				x
	National Supply Company				x	x
Drilling Rigs - Slant Service	North Eastern Drilling Ltd.					
	Slant Drill Systems Ltd.					
	CDEL (Canadian Drilling Equipment Ltd.)	x				x
Kellys and Kelly Bushings	Dreco Ltd.					
Kelly Cocks	Wenzel Oil Tool Ltd.					
Mud and Mud Activities	Avonlea Minerals Ltd.					
	Wilson Mud Service Ltd.					
	Canadian Mud Lab Chemicals					
Mud Pumps	Tri-Service Oilfield Mfg. Ltd.					
	O.P.I. Ltd.					
Mud Pump Fluid End Parts	Tri-Service Oilfield Mfg. Ltd.					
	O.P.I. Ltd.					
	National Supply Company Ltd.				x	x
Pipe Handling Equipment	Tri Ocean Engineering Ltd.	x	x			x
Pollution Control	Bennet Environment Consultants Ltd.	x	x			x
	Morris Industries Ltd.	x	x			x
Rotary Tables	Dreco Ltd.					
Sheaves	Dreco Ltd.					
Shale Shakers	Flo-Rite Industries Ltd.					
	Schiffner Oilfield Company Ltd.					
	Wagner Oilfield Mfg. Ltd.	x	x	x		x
Shale Shaker Screens	Greening Donald Co. ltd.	x	x			x
Swivels	Tri Service Oilfield Mfg. Ltd.					
Swivels - (electric, power)	Slant Drill Systems Ltd.					
Tongs - (power, casing)	Farr International 1979 Ltd.					
Travelling Blocks	Tri Service Oilfield Mfg. Ltd.					

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
Wireline Equipment - (winches, etc.)	Matt's Manufacturing Ltd.					
	Computalog Gearhart Ltd.					
	J.T. Hepburn Ltd.	x				x
	Lantec Industries Ltd.	x				x
	Ramsay Machine Works Ltd.	x				x
	Pull Master	x	x	x		x
2. CONSULTING SERVICES						
Engineering Consultants (Coastal, Offshore, Gas and Oil)	Canadian Marine Engineering Ltd.	x				x
	Canocean Resources Inc.	x	x			x
	Peter S. Hatfield Ltd.	x	x			x
	Lavalin	x	x			x
	Morrow Engineering Ltd.	x				x
	Swan Wooster Engineering Co. Ltd.	x	x	x		x
	Tri-Ocean Engineering Ltd.	x	x			x
	Venture Energy Consultants Ltd.	x				x
	W.T.I. Engineers and Contractors	x				x
Environmental Consultants	Bennett Environmental Consultants Ltd.	x	x			x
	EBA Engineering	x	x	x		
	IEC Beak Consultants Ltd.	x	x	x		x
Geotechnical Engineers	Thurber Consultants Ltd.	x	x	x		x
	EBA Engineering	x	x	x		x
	Harding Lawson					
Naval Architects	Robert Allen Ltd.	x	x			x
Structural Fabricators	Easteel Industries Ltd.	x				x
	EBCO	x	x			x
	Dominion Bridge				x	x
3. PROCESS/PRODUCTION EQUIPMENT						
Chokes - Production	G.B. Master Flo Valve Corpn Ltd.	x	x			x
- Steam Injection	Willis Canada					
Coiled Tubing Units	Nowsco Well Services Ltd.	x	x			x
	Dyer Equipment Mfg. Inc.	x	x			x
	Rebound Rig Ltd.					
Controls, Miscellaneous	Barber Industries	x				x
	Kobelt Manufacturing Co. Ltd.	x				x
	Prime Mover Controls Inc.	x				x
	Wagner Engineering Ltd.	x				x
Gauges - (Fluid Level)	C.P.W. Value and Instrument Ltd.	x				x
Headers - (multiple outlet, extruded)	Steel Flo Industries Ltd.					

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
Production Equipment - (surface)	Cameron Ironworks of Canada Ltd.				x	x
	C.E. Natco Ltd.				x	x
	Maloney Steel Ltd.	x				x
Heaters Treaters Dehydrators Free Water Knock-Outs Separators Sweeteners Scrubbers						
Pump Jacks	Curtis Hoover Ltd.	x				x
Stuffing Boxes	Le Grand Industries Ltd.					
	Positive Action Tool Western Ltd.					
Sulphur Handling Equipment	Procor Ltd.	x				x
Testing Equipment and Systems - (oil and gas)	Barringer Research Ltd.	x				x
	Porta Test Systems Ltd.	x	x			x
	Noward Energy Services Ltd.	x	x			x
	Opsco Industries Ltd.					
	Koomey Control Systems of Canada Ltd.				x	x
Thermal Recovery Tools and Systems	Endiem Oil Tool Ltd.					
Traps - (pig launching)	Steel Flo Industries Ltd.					
	Barber Industries					
Valve Actuators	Erichsen Industries Ltd.	x				x
Wellhead Assemblies	Barber Industries					
	Alberta Walker Willheld Ltd.					
	Stream Flo Industries Ltd.					
	Ebco Industries Ltd.	x	x			x
	National Supply Company				x	x

4. DOWNHOLE TOOLS, COMPLETION AND WORKOVER EQUIPMENT

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
Acidizing Units	Nowsco Well Services Ltd.	x	x			x
	Canadian Fracmaster Ltd.	x				x
	Dyer Equipment Mfg. Inc.	x	x			x
Blow-Out Preventers - (workover)	Aco Industries Ltd.	x	x			x
	Kremco Ltd.					
	Koomey Control Systems of Canada Ltd.				x	x
- (steam injection)	Arinah Services Ltd.					
	Positive Action Tool Western Ltd.					
- hoses	Continental Petroleum Rubber Co. Ltd.	x	x			x

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
Cementing Tools	Site Oil Tools Ltd.					
	Top-Co Industries Ltd.					
	Continental Petroleum Rubber Co. Ltd.	x	x			x
Completion Tools	Site Oil Tools Ltd.					
	Walters Oil Tool Mfg. Ltd.					
Core Barrels	Canadian Diamant Boart Ltd.					
Drill Stem Testing and Tools	Mandarin Oilfield Services Ltd.					
	Walters Oil Tool Machine Ltd.					
	Canadian Formation Testers Ltd.					
Drilling Jars	O.P.I. Ltd.					
	Jarco Services Ltd.					
	Wenzel Oil Tool Ld.					
	Walters Oil Tool Machine Ltd.					
	Griffith Oil Tool Ltd.				x	x
Fishing Tools	Four M Oilfield Services Ltd.	x				x
	Griffith Oil Tool Ltd.				x	x
	John T. Hepburn Ltd.	x				x
Gravel Pack Tools	Endiem Oil Tool Ltd.					
Hole Openers	Canadian Strata Drill Ltd.					
Mud Motor - Speed Reducers (downhole)	Wenzel oil Tool Ltd.					
Oilfield Perforating Guns	Gris-Gun Manufacturing Ltd.	x				x
Packers	Site Oil Tools Ltd.					
Production Tools - (downhole)	Site Oil Tools Ltd.					
Reamers	Griffith Oil Tool Ltd.				x	x
	Faster Oil Tool					
	Rostel Industries Ltd.					
Shock Subs	Griffith Oil Tools Ltd.				x	x
	Jarco Services Ltd.					
	O.P.I. Ltd.					
	Wenzel Oil Tool Ltd.					
Stabilizers	Techwest Enterprises Ltd.	x	x			x
	Faster Oil Tool					
	Griffith Oil Tool Ltd.				x	x
	Rostel Industries Ltd.					
Under Reamers	Canadian Strata Drill Ltd.					
Workover Rigs - (platforms, moveable)	Dreco Ltd.					

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
5. FUBULARS						
Casing and Production Tubing	Algoma Steel					
	Dover Corporation Ltd.				x	x
	Stelco Inc.	x				x
	T.P.S. Industries Inc.	x				x
Drill Collars	Faster Oil Tools					
Liner Hangers	Endiem Oil Tool Ltd.					
6. SAFETY/ENVIRONMENTAL PROTECTION EQUIPMENT						
Flame Arrestors	Maloney Steel Ltd.	x				x
	Porta Test Systems Ltd.	x	x			x
Flare Stack Ignitors	Mactronic Systems Ltd.					
	Barber Industries					
	Sparrow Electric Ltd.					
Survival Boats	Beaufort Air-Sea Equipment	x	x			x
	Harris Scientific Products Ltd.	x	x			x
	C.W. Lucas Ltd.	x	x			x
	Marine Sales and Services Ltd.	x				x
	Watercraft Canada Ltd.	x				x
Survival Suits and Equipment	Dart	x	x			x
7. ELECTRICAL INSTRUMENTATION AND COMMUNICATION EQUIPMENT						
Cables and Wires	Canada Wire and Cable Inc.	x	x	x		x
	Greening Donald Co. Ltd.	x	x			x
Communication Equipment and Controls	Glenayre Electronics	x	x			x
	Meteor Communications Corp	x				x
	Palidor Consultants Ltd.	x				x
	Spilsbury Communications Ltd.	x				x
Pressure/Volume/Temperature Monitors	Chimo Equipment Ltd.	x				x
	SPW Valve & Instrument Co. Ltd.	x				x
8. DRILLING AND PRODUCTION SUPPORT EQUIPMENT						
Boilers (drill rig)	Lister Oilfield Equipment					
	Dupre Boilers and Welding					
Burners (oilfield, smokeless)	Porta Test Systems Ltd.	x	x			x
	Lister Oilfield Equipment					
Bulk Containers	Pioneer Plastics & Services Co. Ltd.	x				x
	Set Industries Ltd.	x				x

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
Compressors	Clark (Dresser)				x	x
	DeLaval Turbine Ltd.				x	x
	Jmar Compressors Inc.	x				x
Cranes - (B.O.P., Bridge)	Tri Ocean Engineering	x	x			x
	John T. Hepburn Ltd.	x				x
Crosses	Steel Flo Industries Ltd.					
Desalinators	Koomey Control Systems				x	x
	Seagold Industries Corp	x				x
Generators	Cullen Detroit Dielsel Allison Ltd.				x	x
	Global Thermoelectric					
	Power Systems Inc.	x	x			x
Heaters - (infra-red, explosion proof)	Cis-Can Sales Western Ltd.	x	x			x
- (heat exchangers)	APV Crepaco Ltd.	x	x			x
Power Equipment	Cullen Diesel Detroit Allison Ltd.				x	x
	Finning Power Products	x	x			x
	Clark (Dresser)				x	x
Pumps	Atlas Engineering Co. Ltd.	x				x
	Canadian Oilfield Simulation Services	x				x
Storage Systems	Arpac Storage Systems	x				x
Valves - Butterfly	Dover Corporation Ltd.				x	x
- Gate	Alberta Walker Wellhead Ltd.					
	Stream Flo Industries Ltd.					
	McEvoy Wellhead Controls Ltd.					
	W.K.M. Valve					
	Canada Valve	x				x
- Ball	G.B. Master Flo Valve Corp Ltd.	x				x
	Borsig Hartmann Valve Ltd.					
	W.K.M. Valve					
- Trunnion	Posi-Seal Ltd.	x				x
- Check	Stream Flo Industries Ltd.					
	G.M. Check Valve Ltd.					
- Control	Canada Valve	x				x
	Singer Valve	x	x			x
- Ball Injector	George and Nicks Machine Works Ltd.	x				x
- Orifice	Camco Ltd.	x				x
	Willis Canada					

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
9. MISCELLANEOUS/PLATFORM SUPPORT EQUIPMENT						
Aircraft (Pollution Control)	Conair Aviation Ltd.	x				x
Anchors	IMW Industries Ltd.	x	x			x
Chains and Morring Systems	Lister Bolt and Chain Ltd.				x	x
Corrosion	Canada Metal Co. Ltd.	x				x
	Electrolytic Corrosion Services Ltd.	x	x			x
Diving Services	Can-Dive Services Ltd.	x	x			x
	Fraser Burrard Diving Ltd.	x				x
Diving Suits and Helmets	Can-Dive Services Ltd.	x	x			x
	Cosel Ltd.	x				x
	Fitz-Wright Suits Ltd.	x	x			x
Flanges	Barber Industries					
Helicopters & Equipment	Okanagan Helicopters	x				x
	Sealand Helicopters Ltd.	x				x
	S.E.I. Industries Ltd.	x				x
Hyperbaric Chambers	Cosel	x				x
	Hayes-Dana Inc.				x	x
Navigational Equipment	EDO Canada Ltd.				x	x
	McElhanney	x	x			x
	Offshore Survey & Navigation Ltd.	x	x			x
Oceanographic Equipment	Applied Microsystems Ltd.	x				x
	Arctic Sciences Ltd.	x				x
	Dobrocky Seatech	x	x			x
	Seakem Oceanography Ltd.	x				x
	Seastar Instruments Ltd.	x	x			x
Oil Spill Tracker Buoys						
Offshore Surveying Equipment (deep tow sub bottom profiling, etc.)	McElhanney	x	x			x
	Offshore Survey and Navigation Ltd.	x	x			x
Submersibles - (manned, deep rover)	Can-Dive Services Ltd.	x	x			x
	Cosel Ltd.	x				x
Thrusters - (Marine)	Ulstein Maritime Ltd.	x				x
Underwater Accoustic Telementry Systems	Fraser Burrard Diving Ltd.	x				x
	Mesotech Systems Ltd.	x	x	x		x
	Seastar Instruments Ltd.	x				x
Underwater Cameras	Cosel Ltd.	x				x

ITEM	MANUFACTURER	CANADIAN COMPANY	TRADING IN USA	TRADING IN CALIF.	AMERICAN SUBSIDIARY	RESPONDED
Underwater Equipment and Diving Support Hardware (electrical sliprings, rotary fluid unions, etc.)						
Vessels (tugs, barges, supply and survey)	Bel-Aire Shipyard Ltd.	x	x			x
	Burrard Yarrows Corp.	x	x			x
	Marystown Shipyard Ltd.	x				x
	Genstar Marine	x	x	x		x

APPENDIX 'J'

TYPICAL DRILLING, POWER & UTILITY EQUIPMENT ON A FIXED OFFSHORE PLATFORM

(a) Drilling Equipment (per rig)

(b) Power and Utility Equipment (per rig)

The following typical equipment is to be found on a drilling rig operating from a fixed platform offshore California. Indications of equipment capacities and ratings are given where possible.

(a) DRILLING EQUIPMENT

	Item	General Description
1.	Derrick	30' x 30' base, 150' high, of welded construction and rated for 1,000,000lb hook load including crown block and racking platform
2.	Drawworks	2,000 HP DC motor driven drawworks suitable for 20,000 foot well depths, equipped with 1 1/2 inch drill line, sandline reel for 20,000 feet of 9/16 inch line, elmagco type brake, and catheads
3.	Mud Pumps	2 each 1600 HP triplex mud pumps equipped with suction and discharge pulsation dampeners, relief valves, tachometers, etc. rated for 5000 psi discharge
4.	Rotary Table and Bushings	37 1/2 inch independent drive rotary powered by one 800 HP DC electric drilling motor
5.	Travelling Block	500 ton
6.	Hook	500 ton
7.	Swivel	500 ton
8.	Mud Processing	5 - Tank processing system. Each tank approximately 40 barrels capacity with agitators, pumps, and piping to accommodate the following: Shale Shakers - 3 each dual screen Desanders - 1500 gpm capacity Desilters/Mud Cleaner - 2 x 600 gpm capacity Degasser Centrifuge Cuttings Wash System (state waters only)

9. Drill String	5 inch, Grade E Range 2 with NC-50 connections
	5 inch, Grade S-135 Range 2 with NC-50 connections
	3 1/2 inch Grade G Range 2 with NC-38 connections
	5 inch Range 2 heavy-wall with NC-50 connections
10. Drill Collars	9 1/2" OD x 3 1/2" ID
	8" OD x 2 13/16" ID
	6 1/2" OD x 2 1/4" ID
	4 3/4" OD x 2 1/4" ID
11. Kelly & Kelly Drive Bushing	2, 5 1/4" hex kellys, 45 foot long
12. Drill String	2 sets 350 ton elevator links
	2, 5 inch 350 ton drill pipe elevators
	2, 3 1/2" 250 ton drill pipe elevators
	2 sets drill pipe rotary tongs
	2 sets casing tongs
	2 sets heavy weight drill pipe rotary tongs
	2 sets of rotary slips for all drill pipe sizes
	1 set of rotary slips for each drill collar and casing size
	2 sets each 100 ton side door elevators for each drill collar size used
	4 sets each liftsubs for each drill collar size used
13. Casing Tools	500 ton air operated slip type casing elevator/spiders, equipped with slips and guides for 7" thru 13" casing

		2 sets each 150 ton side door elevators for 5" through 20" casing
		1 set 500 ton - 144 inch elevator links
		2 sets each single joint elevators for 7" through 20" casing
		Hydraulic powered casing tong
14.	Bulk Storage	P-tanks for storage of barites, cement, gel, chemicals and other mud additives
15.	Bulk Mixing and Charging	100 HP centrifugal pumps manifolded for either mud charging or mud mixing with barite and cement surge tanks and open mixing hoppers with cutting tables
16.	BOP and Diverter	13 5/8" 5000 psi WP BOP 21 1/4" 2000 psi WP BOP 29 1/2" 500 psi WP annular diverter
17.	BOP Control System	Hydraulic control system including accumulator bank, reservoir, charge pumps, control manifold to operate the rams, annular and diverter and remote panels for remotely controlling all BOP and diverter functions
18.	Control Consoles	Drillers control and alarm panel, BOP control panel, rig skidding control panel and fire and safety alarm panel
19.	Choke Manifold	10,000 psi choke manifold with two 3" remote operated power chokes and two 3" manually operated adjustable chokes. All valves upstream of choke rated for 10,000 psi and downstream of choke for 3,000 psi
20.	Drilling Instruments	Drilling recorder to measure hook load, pump speed, rotary speed and torque, mud pressure, and penetration rate, etc.
		Mud volume totalizer for all pits with total volume and gain/loss indication
21.	Fishing Toos	Two each full strength releasing and circulating overshots with spiral grapples and baskets to catch each size drill pipe and collar
		One short catch overshot for 5" drillpipe

		Two fishing magnets 12" and 7" OD
		Reverse Circulating Junk Baskets with mill shoes for all hole sizes
22.	Cementing Unit	Diesel drive dual pump cementing unit with recirculating mixer
23.	BOP Handling Equipment	Independent, rail-mounted BOP handing crane capable of lifting entire BOP stack as single unit
24.	Skidding System	To allow positioning of drill floor over well slots
25.	Well Testing Equipment	Three phase 1440 psi WP separator, gauge tanks and two smokeless flare booms complete with oil, water, gas, air, and igniter lines

(b) Power and utility Equipment (Per Rig)

1.	Generators	Gas turbine driven 600 volt 60 Hz AC generators
2.	Emergency Generator	Diesel powered, 650 KW/480V rating
3.	Air Compressors	Electric driven, 1500 SCFM at 125 psi, with one diesel powered cold start backup, and air dryers and controls
4.	SCR System	SCR type switching equipment sized to match power generating equipment for converting 600 volt 60 Hz AC to 750 volt DC with redundant bussbar operation should one bussbar fail to allow continuous power to primary drilling equipment.
5.	AC System	Split primary 600 volt buss, each buss supplying two 1500 KW/600V/480V transformers for distribution to various operating compartments of the platform
6.	Watermakers	Reverse osmosis type including pressurizing pumps, chemical addition pumps, filtration and backwashing equipment, etc.
7.	Sewage Units	Marine type bilogical surge treatment units

8.	Patform Pumps	For drill water, fire and potable water supply
9.	Cranes	External pedestal mounted cranes for platform loading/offloading and internal manual or powered cranes for bulk handing and equipment maintenance
10.	Radio and Communications	VHF/FM radio telephones, aircraft radio, helicopter beacons, radio telegraph, battery powered maritime radio telephone, emergency transceivers for each lifeboat, intercom/PA system
11.	Lifeboats	50 man, covered life/survival boats, davit launched, including life jackets
12.	Workshop Equipment	Welders, pipe threaders, pipe benders, grinders, etc.
13.	Helicopter Fuel System	Transportable jet fuel tanks with pump, hose reels, etc.
14.	Crew Accommodations and Facilities	Bedding, linens, furniture, washrooms, galley equipment, mess room, laundry room, recreational and exercise facilities, hospital supplies, etc.
15.	Environmental Instrumentation	Indicating and recording equipment for air/sea temperature, wind speed and direction, barometric pressure and ocean current
16.	Fire Protection	Detection systems and alarms for combustible gas, H^2S and fire. CO^2, Halon, and water fire fighting equipment

APPENDIX 'K'

TARIFF SCHEDULES OF THE UNITED STATES

ANNOTATED (1984)

GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty		
					1	LDDC	2
A	652.75	00	Sign-plates, name-plates, numbers, letters, and other signs, all the foregoing of base metal............	X.......	5.9% ad val.	3.8% ad val.	45% ad val.
	652.76	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)....	X.......	Free		
A	652.80	00	Expanded metal, of base metal..........................	Sq. ft.v Lb.	5.9% ad val.	3.8% ad val.	45% ad val.
			Springs and leaves for springs, of base metal:				
A*	652.84	00	Suitable for motor-vehicle suspension.............	X.......	4% ad val.		25% ad val.
	652.85	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)........................	X.......	Free		
A	652.86	00	Hairsprings....................................	X.......	4.2% ad val.	3.7% ad val.	65% ad val.
	652.87	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)........................	X.......	Free		
A	652.88	00	Other..	X.......	7.1% ad val.	5.7% ad val.	45% ad val.
	652.89	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)........................	X.......	Free		
			Hangars and other buildings, bridges, bridge sections, lock-gates, towers, lattice masts, roofs, roofing frameworks, door and window frames, shutters, balustrades, columns, pillars, and posts, and other structures and parts of structures, all the foregoing of base metal:				
			Of iron or steel:				
			Door and window frames:				
A	652.90	00	Of stainless steel......................	Lb......	5.3% ad val.	3.4% ad val.	35% ad val.
A	652.92	00	Other..................................	Lb......	3.8% ad val.	2.4% ad val.	25% ad val.
			Columns, pillars, posts, beams, girders, and similar structural units:				
			Not in part of alloy iron or steel:				
A	652.93	00	Cast-iron (except malleable cast-iron) articles, rough or advanced........................	Lb......	1.4% ad val.		10% ad val.
	652.94	00	Other..............................	Lb......	3.1% ad val.	2.8% ad val.	20% ad val.
			In part of alloy iron or steel:				
	652.95	00	In part of stainless steel..........	Lb......	4.9% ad val.	4.2% ad val.	30% ad val.
	652.96	00	Other..............................	Lb......	4.5% ad val.	3.9% ad val.	28% ad val.
	652.97	00	Offshore oil and natural gas drilling and production platforms and parts thereof........	Lb......	7.1% ad val.	5.7% ad val.	45% ad val.
A	653.00	00	Other..	Lb......	7.1% ad val.	5.7% ad val.	45% ad val.
A	653.01		Other..	....	7.1% ad val.	5.7% ad val.	45% ad val.
		10	Mobile homes...................................	No.			
		20	Other..	Lb.			
			Fence or sign posts of iron or steel:				
	653.02	00	Not of alloy iron or steel........................	Lb......	Free		20% ad val.
A	653.03	00	Of alloy iron or steel............................	Lb......	5.5% ad val.		28% ad val.

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

G S P	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty		
					1	LDDC	2

PART 4. - MACHINERY AND MECHANICAL EQUIPMENT

Part 4 headnotes:

1. This part does not cover —
   - (i) bobbins, spools, cops, tubes, and similar holders;
   - (ii) belts and belting;
   - (iii) machine clothing, other than card clothing provided for in items 670.52 and 670.54;
   - (iv) articles of textile materials; articles of stone, of ceramic ware, of glass, or of other materials provided for in schedule 5; or articles of leather or of fur on the skin; or
   - (v) articles and parts of articles specifically provided for elsewhere in the schedules.

2. Unless the context requires otherwise, and subject to headnote 1 to subpart A of this part, a multi-purpose machine is classifiable according to its principal purpose, but if such a machine is not described in a superior tariff heading as to its principal purpose, or if it has no one principal purpose, it is classifiable in subpart H of this part as a machine not specially provided for.

3. An electric motor or other power unit imported with a machine is classifiable with such machine as an entirety if fitted thereto when imported, or, if the machine or its framework is designed to receive the power unit, or if the shipment includes a common base designed to receive both the power unit and the machine.

Subpart A. - Boilers, Non-Electric Motors and Engines, and Other General-Purpose Machinery

Subpart A headnote:

1. A machine or appliance which is described in this subpart and also is described elsewhere in this part is classifiable in this subpart.

SCHEDULE 6. - METALS AND METAL PRODUCTS
Part 4. - Machinery and Mechanical Equipment

GSP	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty LDDC	Rates of Duty 2
A	660.10		Steam and other vapor generating boilers (except central heating hot water boilers capable also of producing low pressure steam), and parts thereof		6.5% ad val.		45% ad val.
			Boilers:				
		10	Water tube stationary steam generating boilers	Ton			
		20	Other	Ton			
			Parts:				
		30	Heat exchangers	Ton			
		40	Other	Ton			
A	660.15		Economizers, superheaters, soot removers, gas recoverers, and auxiliary plants for use with steam and other vapor generating boilers; condensers for vapor engines and power units; all of the foregoing and parts thereof		7% ad val.		45% ad val.
		10	Condensers	Ton			
		20	Other	Ton			
			Producer gas and water gas generators, with or without purifiers; acetylene gas generators (water process) and other gas generators, with or without purifiers; all the foregoing and parts thereof:				
A	660.20	00	Apparatus for the generation of acetylene gas from calcium carbide, and parts thereof	X	3.4% ad val.	3.1% ad val.	20% ad val.
A	660.22	00	Other	X	4.4% ad val.	2.8% ad val.	45% ad val.
			Steam engines, steam turbines, and other vapor power units, and parts thereof:				
A	660.25	00	Steam engines and parts thereof	X	4% ad val.		15% ad val.
A	660.30		Steam turbines and parts thereof		7.5% ad val.		20% ad val.
		20	Steam turbines	No.			
		40	Parts	X			
A	660.35	00	Other	X	4.5% ad val.		27.5% ad val.
			Internal combustion engines and parts thereof:				
			Piston-type engines:				
	660.40		To be installed in tractors of a type provided for in item 692.34 or in agricultural or horticultural machinery or implements provided for in item 666.00		Free		Free
			Compression-ignition engines:				
		04	50 horsepower and under	No.			
		06	Over 50 horsepower	No.			
			Other:				
		08	50 horsepower and under	No.			
			Over 50 horsepower:				
		10	Air cooled	No.			
		12	Other	No.			
			Other:				
A*	660.42		Compression-ignition engines		4.2% ad val.	3.7% ad val.	35% ad val.
		20	For automobiles (including trucks and buses)	No.			
			Other:				
			For marine craft:				
		42	150 horsepower and under	No.			
		44	Over 150 but not over 300 horsepower	No.			
		46	Over 300 horsepower	No.			
		60	Other	No.			
	660.43	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	No.	Free		

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

GSP	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty		
					1	LDDC	2
			Internal combustion engines and parts thereof (con.):				
			Piston-type engines (con.):				
			Other (con.):				
			Engines other than compression-ignition engines:				
			Specially designed for:				
A*	660.48	❶	Automobiles (including trucks and buses).............	....	3.4% ad val.	3.1% ad val.	35% ad val.
		10	Used or rebuilt	No.			
		50	Other....................	No.			
	660.49	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)......	No......	Free		
A	660.56		Other.........................	....	1.5% ad val.	Free	35% ad val.
		10	Specially designed for aircraft..................	No.			
			Outboard motors for marine craft:				
		22	Under 30 horse-power...............	No.			
		24	30 horsepower and over..............	No.			
		30	Other....................	No.			
	660.57	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)......	No......	Free		
	660.58	00	If certified for use in civil aircraft (see headnote 3, part 6C, schedule 6).............	No......	Free		35% ad val.
			Non-piston type engines:				
A	660.59		Aircraft engines............................	....	5% ad val.		35% ad val.
		20	Turbo-jet and gas turbine, new...........	No.			
		40	Other..................................	No.			
	660.61	00	If certified for use in civil aircraft (see headnote 3, part 6C, schedule 6)....	No......	Free		35% ad val.
A	660.62		Other..	....	5% ad val.		35% ad val.
		10	Gas turbines............................	No.			
		80	Other..................................	No.			
	660.63	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)......................	No......	Free		
			Parts:				
	660.64	00	Cast-iron (except malleable cast-iron) parts, not alloyed and not advanced beyond cleaning, and machined only for the removal of fins, gates, sprues, and risers or to permit location in finishing machinery...........	Lb......	Free		10% ad val.

(1st supp. 1/6/84)

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty LDDC	Rates of Duty 2
			Internal combustion engines and parts thereof (con.):				
			Parts (con.):				
			Other parts:				
A	660.67		Parts of piston-type engines other than compression-ignition engines		3.4% ad val.	3.1% ad val.	35% ad val.
			Parts of automobile engines (including truck and bus engines):				
		07	Connecting rods	No. v Lb.			
		13	Crankshafts	No. v Lb.			
		18	Other	X			
			Parts of marine craft engines:				
		23	Connecting rods	No. v Lb.			
		27	Crankshafts	No. v Lb.			
		32	Other	X			
			Other:				
		43	Connecting rods	No. v Lb.			
		47	Crankshafts	No. v Lb.			
		52	Other	X			
	660.68	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X	Free		
	660.69	00	If certified for use in civil aircraft (see headnote 3, part 6C, schedule 6)	X	Free		35% ad val.
A	660.71		Other		4.2% ad val.	3.7% ad val.	35% ad val.
			Parts of compression-ignition piston-type engines:				
			Parts of automobile engines (including truck and bus engines):				
		07	Connecting rods	No. v Lb.			
		13	Crankshafts	No. v Lb.			
		18	Other	X			

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

G S P	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty		
					1	LDDC	2
			Internal combustion engines and parts thereof (con.):				
			Parts (con.):				
			Other parts (con.):				
A	660.71 (con.)		Other (con.):				
			Parts of compression-ignition piston-type engines (con.):				
			Parts of marine craft engines:				
		23	Connecting rods..........	No. v Lb.			
		27	Crankshafts..............	No. v Lb.			
		32	Other....................	X			
			Other:				
		43	Connecting rods..........	No. v Lb.			
		47	Crankshafts..............	No. v Lb.			
		50	Other....................	X			
			Parts of non-piston type engines:				
		60	Parts of aircraft engines......	X			
		65	Parts of non-aircraft gas turbine engines..............	X			
		70	Other.........................	X			
	660.72	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)....	X.......	Free		
	660.73	00	If certified for use in civil aircraft (see headnote 3, part 6C, schedule 6)...............	X.......	Free		35% ad val.
			Water wheels, water turbines, and other water engines, and parts including governors therefor:				
A	660.74	00	Governors..	No......	$1.12 each + 17.5% ad val.		58.5% ad val.
A	660.76		Other..	....	7.5% ad val.		27.5% ad val.
		20	Water wheels, water turbines, and other water engines..........................	No.			
		40	Parts..	X			
			Non-electric engines and motors not specially provided for, and parts thereof:				
A	660.77	00	Hydrojet engines for motor boats, and parts thereof..	X.......	2.4% ad val.		30% ad val.
❷A	660.80	00	Spring-operated and weight-operated motors.........	No......	6.3% ad val.	4% ad val.	35% ad val.
A	660.85		Other..	....	3.8% ad val.	3.4% ad val.	27.5% ad val.
		10	Linear hydraulic motors (hydraulic cylinders) and parts thereof.................	X			
		20	Other...	X			
	660.86	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).........................	X.......	Free		
	660.87	00	Non-electric engines and motors, if certified for use in civil aircraft (see headnote 3, part 6C, schedule 6).............	X.......	Free		27.5% ad val.

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

GSP	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty LDDC	Rates of Duty 2
			Pumps for liquids, whether or not fitted with measuring devices; liquid elevators of bucket, chain, screw, band, and similar types; all the foregoing whether operated by hand or by any kind of power unit, and parts thereof:				
A	660.92	00	Fuel injection pumps for compression-ignition engines, and parts thereof	X	2.7% ad val.	2.5% ad val.	35% ad val.
	660.93	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X	Free		
A	660.96	00	Stock pumps, and parts thereof, imported for use with machines for making cellulosic pulp, paper, or paperboard	X	1.3% ad val.	Free	35% ad val.
A	660.97		Other		3.8% ad val.	3% ad val.	35% ad val.
		02	Motor-vehicle pumps	No.			
		05	Measuring and dispensing pumps	No.			
		10	Hydraulic fluid power pumps	No.			
			Other:				
		25	Reciprocating pumps	No.			
			Centrifugal pumps:				
		35	Single-stage, single-suction, close-coupled	No.			
		45	Single-stage, single-suction, frame-mounted	No.			
		50	Single-stage, double-suction	No.			
		52	Multistage, single- or double-suction	No.			
		54	Other	No.			
		56	Other, except parts	No.			
		60	Parts	X			
	660.98	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X	Free		
	660.99	00	Pumps for liquids, operated by any kind of power unit, if certified for use in civil aircraft (see headnote 3, part 6C, schedule 6)	X	Free		35% ad val.
			Air pumps, vacuum pumps and air or gas compressors (including free-piston compressors for gas turbines); fans and blowers; all the foregoing, whether operated by hand or by any kind of power unit, and parts thereof:				
			Fans and blowers, and parts thereof:				
A	661.05	00	Blowers for pipe organs	No.	1.9% ad val.	Free	35% ad val.
A*	661.06		Other		5.6% ad val.	4.7% ad val.	35% ad val.
		10	Electric fans, other than for permanent installation	No.			
		20	Fans and blowers suitable for use with motor vehicles	No.			

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty		
					1	LDDC	2
			Centrifuges; filtering and purifying machinery and apparatus (other than filter funnels, milk strainers, and similar articles), for liquids or gases; all the foregoing and parts thereof (con.):				
			Other:				
A	661.92	00	Cast-iron (except malleable cast-iron) parts, not alloyed and not advanced beyond cleaning, and machined only for the removal of fins, gates, sprues, and risers or to permit location in finishing machinery...........	Lb......	0.6% ad val.	Free	10% ad val.
	661.93	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).........	Lb......	Free		
A*	661.94	00	Portable air purifiers, not specially designed for industrial use, and filters therefor.........................	X.......	4.5% ad val.	3.9% ad val.	35% ad val.
A	661.95	00	Other..	X.......	4.5% ad val.	3.9% ad val.	35% ad val.
	661.96	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).........	X.......	Free		
	661.97	00	Filtering and purifying machinery and apparatus, if certified for use in civil aircraft (see headnote 3, part 6C, schedule 6).........................	X.......	Free		35% ad val.
			Machinery for cleaning or drying bottles or other containers; machinery for filling, closing, sealing, capsuling, or labelling bottles, cans, boxes, bags, or other containers; other packing or wrapping machinery; machinery for aerating beverages; dish washing machines; all the foregoing and parts thereof:				
A	662.10		Machines for packaging pipe tobacco; machines for wrapping candy; machines for wrapping cigarette packages; and combination candy cutting and wrapping machines; all the foregoing and parts thereof..	....	4% ad val.	3.4% ad val.	35% ad val.
		20	Machines for wrapping candy....................	No.			
		40	Other machines............................	No.			
		60	Parts of the foregoing........................	X			
A	662.15	00	Can-sealing machines, and parts thereof............	X.......	5.6% ad val.	4.5% ad val.	30% ad val.
			Other:				
A	662.18	00	Cast-iron (except malleable cast-iron) parts, not alloyed and not advanced beyond cleaning, and machined only for the removal of fins, gates, sprues, and risers, or to permit location in finishing machinery...........................	X.......	1.4% ad val.	1.3% ad val.	10% ad val.
A	662.20		Other..	....	4.3% ad val.	3.6% ad val.	35% ad val.
			Strapping machines and parts, thereof:				
		30	Machines..............................	No.			
		35	Parts................................	X			
			Other wrapping and packaging machines and parts thereof:				
		45	Machines..............................	No.			
		50	Parts................................	X			
		65	Other..................................	X			

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

SCHEDULE 6. - METALS AND METAL PRODUCTS
Part 4. - Machinery and Mechanical Equipment

Subpart B. - Elevators, Winches, Cranes, and Related Machinery; Earth-Moving and Mining Machinery

Subpart B headnote:

1. This subpart does not cover --
   (i) cranes or other machines mounted on vehicles, on vessels or other floating structures, or on other transport equipment (see part 6 of this schedule); or
   (ii) agricultural implements (see subpart C of this part).

GSP	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	LDDC	2
			Mechanical shovels, coal-cutters, excavators, scrapers, bulldozers, and other excavating, levelling, boring, and extracting machinery, all the foregoing, whether stationary or mobile, for earth, minerals, or ores; pile drivers; snow plows, not self-propelled; all the foregoing and parts thereof:				
A	664.06	00	Peat excavators	No.	1.9% ad val.	Free	35% ad val.
A	664.07		Backhoes, shovels, clamshells, draglines, and wheel-type front-end loaders		3.1% ad val.	2% ad val.	35% ad val.
		10	Backhoes, shovels, clamshells and draglines	No.			
		20	Wheel-type front-end loaders	No.			
A	664.08		Other		3.4% ad val.	2.5% ad val.	35% ad val.
		10	Drilling or boring machines	No.			
		20	Tracklaying-type front-end loaders	No.			
		30	Other machines	No.			
			Parts (including parts for articles provided for in items 664.06 and 664.07):				
		35	Track links	Lb.			
		42	Other	X			
A*	664.10		Elevators, hoists, winches, cranes, jacks, pulley tackle, belt conveyors, and other lifting, handling, loading, or unloading machinery, and conveyors, all the foregoing and parts thereof not provided for in item 664.06, 664.07, or 664.08		3.1% ad val.	2% ad val.	35% ad val.
		05	Industrial robots	No.			
			Other:				
		15	Elevators, including freight, and moving stairways	No.			
			Conveyors:				
		25	Belt	No.			
		31	Other	No.			
		44	Hoists	No.			
		55	Overhead traveling cranes	No.			
			Jacks:				
		56	Hydraulic	No.			
		57	Other	No.			
		59	Winches	No.			
		60	Other, except parts	No.			

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

Subpart H. - Other Machines

Subpart H statistical headnotes:

1. For statistical reporting purposes in this subpart (item 678.50), "audio tape players" are those machines designed specifically for reproducing frequencies in the sound spectrum only.

2. For statistical reporting purposes in this subpart, "stereo" apparatus will be considered to be capable of reproducing two (and no more) discrete audio signals.

GSP	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty LDDC	Rates of Duty 2
	678.10	00	Shoe machinery and parts thereof..........................	X.......	Free		Free
A	678.20		Machinery for sorting, screening, separating, washing, crushing, grinding, or mixing earth, stone, ores, or other mineral substances in solid (including powder or paste) form; machinery for agglomerating, molding, or shaping solid mineral fuels, ceramic paste, unhardened cements, plastering materials or other mineral products in powder or paste form; machines for forming foundry molds of sand; all the foregoing and parts thereof..	....	3.7% ad val.	2.9% ad val.	35% ad val.
		10	Machinery for sorting, screening, separating, washing, crushing, grinding, or mixing earth, stone, ores, or other mineral substances in solid (including powder or paste) form.............	No.			
		20	Parts of the foregoing..............................	X			
			Other:				
		30	Designed for use with ceramic paste, unhardened cements, and plastering materials........	No.			
		40	Machines for forming foundry molds of sand....	No.			
		50	Other machinery..............................	No.			
		60	Parts..	X			
			Glass-working machines (other than machines for working glass in the cold); machines for assembling electric filament and discharge lamps and electronic tubes; all the foregoing and parts thereof:				
A	678.30		Glass-working machines and parts thereof...........	....	4.5% ad val.	3.9% ad val.	35% ad val.
		20	Machines..	No.			
		40	Parts..	X			
A	678.32		Other..	....	4.2% ad val.	3.7% ad val.	35% ad val.
		20	Machines..	No.			
		40	Parts..	X			

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

SCHEDULE 6. - METALS AND METAL PRODUCTS
Part 4. - Machinery and Mechanical Equipment

GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty		
					1	LDDC	2
			Molds of types used for metal (except ingot molds), for metallic carbides, for glass, for mineral materials, or for rubber or plastics materials (con.):				
A	680.13		Other	....	4.5% ad val.	3.9% ad val.	35% ad val.
		05	Injection, including die cast dies	No.			
		10	Compression (compaction)	No.			
		15	Blow	No.			
		20	Gravity pour (permanent)	No.			
		25	Other	No.			
			Taps, cocks, valves, and similar devices, however operated, used to control the flow of liquids, gases, or solids, all the foregoing and parts thereof:				
			Hand-operated and check, and parts thereof:				
A	680.14		Of copper	....	7% ad val.	5.6% ad val.	47% ad val.
		10	Under 125 pounds working pressure	Lb.			
			125 pounds working pressure and over:				
		20	Check	Lb.			
		30	Gate	Lb.			
		40	Globe	Lb.			
		50	Plug	Lb.			
		60	Ball	Lb.			
		70	Butterfly	Lb.			
		80	Other	Lb.			
	680.16	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb.	Free		
A	680.17		Of iron or steel	....	9.5% ad val.	8% ad val.	45% ad val.
			Of iron or steel containing over 2.5 percent carbon by weight:				
		05	Check	Lb.			
		10	Gate	Lb.			
		15	Globe	Lb.			
		18	Plug	Lb.			
		25	Ball	Lb.			
		30	Butterfly	Lb.			
		35	Other	Lb.			
			Other:				
		42	Check	Lb.			
		45	Gate	Lb.			
		50	Globe	Lb.			
		55	Plug	Lb.			
		60	Ball	Lb.			
		65	Butterfly	Lb.			
		68	Other	Lb.			
	680.18	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb.	Free		
A	680.19	00	Other	Lb.	6.9% ad val.	4.4% ad val.	45% ad val.
	680.24	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb.	Free		

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty		
					1	LDDC	2
			Taps, cocks, valves, and similar devices, however operated, used to control the flow of liquids, gases, or solids, all the foregoing and parts thereof (con.):				
			Other:				
A	680.25	00	Ballcock mechanisms, and parts	X	4.5% ad val.	3.9% ad val.	35% ad val.
A	680.27		Other		4.2% ad val.	3.7% ad val.	35% ad val.
		20	Safety and relief valves	No.			
		40	Other	X			
	680.28	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X	Free		
	680.30		Antifriction balls and rollers		5.8% ad val.	4.9% ad val.	45% ad val.
			Balls:				
		25	Alloy steel	Lb.			
		30	Other	Lb.			
		40	Rollers	Lb.			
	680.31	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb.	Free		
			Ball or roller bearings, including such bearings with integral shafts, and parts thereof:				
	680.33	00	Ball bearings with integral shafts	No.	4.9% ad val.	4.2% ad val.	35% ad val.
	680.34	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	No.	Free		
			Other:				
	680.37 1/		Ball bearings, and parts thereof		11% ad val.		67% ad val.
			Radial ball bearings, having an outside diameter of:				
		04	Under 9 mm	No.			
		08	9 mm and over but not over 30 mm	No.			
		12	Over 30 mm but not over 52 mm	No.			
		17	Over 52 mm but not over 100 mm	No.			
		18	Over 100 mm	No.			
		22	Ball bearings, other than radial	No.			
			Parts of ball bearings (including parts of articles provided for in item 680.33):				
		27	Inner races and outer races (including inner and outer races of integral shaft bearings provided for in item 680.33)	No.			
		28	Other parts	Lb.			
	680.38 1/		If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)		Free		
			Ball bearings and parts:				
		20	Ball bearings	No.			
		30	Parts of ball bearings	Lb.			

1/ Articles exported to the United States prior to July 1, 1980, must be appraised under the valuation standards provided for in sections 402 and 402a of the Tariff Act of 1930 in effect on June 30, 1980, and are subject to classification under the items of the Tariff Schedules in effect on that date.

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

GSP	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty		
					1	LDDC	2
			Motor vehicles (except motorcycles) for the transport of persons or articles (con.):				
			Other (con.):				
	692.11 (con.)		If Canadian article, but not including any three-wheeled vehicle (see general headnote 3(d)) (con.):				
			On-the-highway, four-wheeled, passenger automobiles (con.):				
			New (con.):				
			Having piston-type engines (con.):				
		30	Over 6 cylinders..........	No.			
		35	Other..........................	No.			
		40	Used..............................	No.			
		60	Vehicles which operate in whole or in part on runners or skis..................	No.			
		80	Other..................................	No.			
			Motor vehicles specially constructed and equipped to perform special services or functions, such as, but not limited to, fire engines, mobile cranes, wreckers, concrete mixers, and mobile clinics:				
A	692.14	00	Fire engines..	No......	6.5% ad val.	5.3% ad val.	25% ad val.
A	692.16		Other..	....	4.2% ad val.	3.7% ad val.	25% ad val.
		10	Mobile cranes....................................	No.			
		30	Other..	X			
			Chassis, bodies (including cabs), and parts of the foregoing motor vehicles:				
			Bodies (including cabs) and chassis:				
	692.20		For automobile trucks and motor buses..........	....	4% ad val.		25% ad val.
			Bodies (including cabs):				
		10	For automobile trucks except truck tractors........................	No.			
		20	For automobile truck tractors.......	No.			
		30	For motor buses......................	No.			

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	LDDC	2
			Subpart B. - Elevators, Winches, Cranes, and Related Machinery; Earth-Moving and Mining Machinery				
			Subpart B headnote:				
			1. This subpart does not cover -- (i) cranes or other machines mounted on vehicles, on vessels or other floating structures, or on other transport equipment (see part 6 of this schedule); or (ii) agricultural implements (see subpart C of this part).				
			Mechanical shovels, coal-cutters, excavators, scrapers, bulldozers, and other excavating, levelling, boring, and extracting machinery, all the foregoing, whether stationary or mobile, for earth, minerals, or ores; pile drivers; snow plows, not self-propelled; all the foregoing and parts thereof:				
A	664.06	00	Peat excavators	No.	3.1% ad val.	Free	35% ad val.
A	664.07		Backhoes, shovels, clamshells, draglines, and wheel-type front-end loaders		3.9% ad val.	2% ad val.	35% ad val.
		10	Backhoes, shovels, clamshells and draglines	No.			
		20	Wheel-type front-end loaders	No.			
A	664.08		Other		4.1% ad val.	2.5% ad val.	35% ad val.
		10	Drilling or boring machines	No.			
		20	Tracklaying-type front-end loaders	No.			
		30	Other machines	No.			
		40	Parts (including parts for articles provided for in items 664.05 and 664.07)	X			
A	664.10		Elevators, hoists, winches, cranes, jacks, pulley tackle, belt conveyors, and other lifting, handling, loading, or unloading machinery, and conveyors, all the foregoing and parts thereof not provided for in item 664.06, 664.07, or 664.08		3.9% ad val.	2% ad val.	35% ad val.
		05	Industrial robots	No.			
			Other:				
		15	Elevators, including freight, and moving stairways	No.			
			Conveyors:				
		25	Belt	No.			
		31	Other	No.			
		44	Hoists	No.			
		55	Overhead traveling cranes	No.			
			Jacks:				
		56	Hydraulic	No.			
		57	Other	No.			
		59	Winches	No.			
		60	Other, except parts	No.			

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

APPENDIX 'L'

INDUSTRY DIRECTORIES

Appendix 'L'

Preamble

An index to contents is given overleaf.

Most of the information contained in Sections 1 to 5 incl. originated, by kind permission, from FOUST'S SALES & SERVICE DIRECTORY which is a comprehensive catalogue of the industry and agencies involved with offshore oil.

Selected information has been extracted and is presented for initial guidance ony. However, for serious involvement in the Californian market, it is strongly recommended that potential exporters purchase a copy of FOUST'S directory which may be obtained from:

FOUST'S Sales & Service Directory - 54th Edition
3703 Long Beach Blvd.
Suite E-Z
P.O. Box 7335
Long Beach, California 90807
(213) 427-1015
Cost: US $33.00+ 6% S.T.

In addition to Foust's Sales and Service Directory, Foust's publish a weekly paper called Foust's Scouting Service. This paper gives details on new and present rig activities for both on and offshore industry in western U.S.A. including Alaska. Subscription cost - 3 months US$ 95 - 12 months US$ $325.

Although not included as part of this Appendix, additional reference should be made to:

WESTERN UNITED STATES including
ALASKA PETROLEUM INDUSTRY YELLOW PAGES.

Obtained from:-

Petroleum Industry Yellow Pages
P.O. 25143
Houston, Texas, U.S.A.
77265/9990

This is a directory listing product names or descriptions alphabetically with company, names adjacent thereto. There is also a 'producers' section indexed by State/City/Location.

General reference should be made also to the California yellow pages available from most good libraries covering Ventura, Kern (Bakersfield), Los Angeles and Orange Counties.

INDEX TO CONTENTS

1. Government/Regulatory Agencies
2. Drilling Companies
3. Operating Companies
4. Consultants
5. Refineries
6. Terminals

1. Government/Regulatory Agencies

STATE OF CALIFORNIA (Continued)
557-1946 — Dave Valoff, Chief of Div. of Occupational Safety & Health Admin.; Victor Muniz, Deputy Chief for Safety; Charles Powell, Ph.D., Deputy Chief for Health; Mike Schneider, Deputy Chief for Safety; Richard Wade, Ph.D., Deputy Chief for Health; Jeanne Werner, Special Asst. to Deputy Chief for Safety; Alvin Greenberg, Ph.D., Special Asst. to Deputy Chief for Health; Robert W. Stranberg, Principal Safety Engineer for Staff Services; Edward F. Callanan, Admin. Asst., (415) 557-2851; BOI & Legal Unit, (415) 557-2960, Michael D. Mason, Chief; CONSULTING ENGINEERING — J. Robert Signer, Asst. Chief, (415) 557-1181. SAN FRANCISCO REGION: 455 Golden Gate Ave., San Francisco 94102 — (415) 557-8640 — John R. Tennison, Reg. Mgr.; Frank J. Kieiian, Dist. Mgr., San Francisco, (415) 557-1677; Leland Anderson, Dist. Mgr., San Jose, (408) 277-1260; Irene Sharenbrach, Dist. Mgr., Berkeley, (415) 540-3030; NORTHERN REGION — Sacramento: 2422 Arden Way, Sacramento 95825 — (916) 920-6127 — Carroll Fristup, Reg. Mgr. Sacramento; Dist. Mgr. Sacramento, (916) 920-6123; Dist. Mgr., Santa Rosa, Paul Bethel, (707) 576-2388; William B. Lindsey, Dist. Mgr., Redding, (916) 246-6571; Roger A. Baker, Dist. Mgr., Modesto, (209) 576-6260; Dist. Mgr. Fresno, Lawrence Baca; (209) 445-5302. SO. REGION — Santa Ana: 28 Civic Center Plaza, Rm. 552, Santa Ana 92701 — (714) 558-4476 — Willis Pugh, Reg. Mgr.; James T. Brown, Dist. Mgr., Santa Ana, (714) 558-4141; Donald G. Amos, Dist. Mgr., San Diego, (619) 237-7325; Kearn Hinchman, Dist. Mgr., San Bernardino, (714) 383-4321; Jean Dickey, Dist. Mgr., Santa Barbara, (805) 682-2578; Lyle Garrett, Dist. Mgr., Bakersfield, (805) 395-2718. LOS ANGELES REGION: 3460 Wilshire Blvd., Los Angeles 90010 — (213) 736-3024 — Robert Garcia, Mgr.; John W. Wachter, Principal Safety Engr., Monitor Service, (213) 736-3035; Dist. Mgr. Los Angeles, Edward Grellert, (213) 736-3041; Edson DeRouen, Dist. Mgr., Vernon, (213) 589-5848; Tom Butler, Dist. Mgr., Long Beach, (213) 590-5035. Panorama City 91402, (213) 988-9200 — Philip Krohn, Reg. Mgr.; James Mason, Dist. Mgr.; Panorama City, (213) 782-1800; Donald Wilbrecht, Dist. Mgr., Santa Fe Springs, (213) 802-1711; Richard Drew, Dist. Mgr., El Monte, (213) 575-6960.

STATE OF CALIFORNIA, STATE LANDS COMMISSION, 245 W. Broadway, Suite 425, Long Beach 90802-4472 — (213) 590-5201.

(SOCIAL SECURITY) FEDERAL SECURITY AGENCY, SOCIAL SECURITY ADM., BUREAU OF OLD AGE AND SURVIVORS INSURANCE — (213) 625-7411.

U.S. DEPARTMENT OF ENERGY, FOSSIL, GEOTHERMAL, SOLAR ENERGY DIV., 1333 Broadway, Oakland 94612 — (415) 273-7951.

U. S. GEOLOGICAL SURVEY, Field Operations, 1340 W. 6th St., Room 160, Los Angeles 90017 — (213) 688-2846 — H. T. Cypher, Acting Deputy Conservation Mgr.

U. S. GEOLOGICAL SURVEY, Public Inquiries Office, Room 7638 Federal Bldg., 300 N. Los Angeles St., Los Angeles 90012 — (213) 688-2850. Hours: 8:30 to 4:00 p.m.

U. S. MINERALS MANAGEMENT SERVICE, Field Operations, 1340 W. 6th St., Room 200, Los Angeles 90017 — (213) 688-2087 — Thomas W. Dunaway, Acting Regional Supervisor.

WESTERN GAS PROCESSORS & OIL REFINERS ASSOCIATION, see Pacific Energy Assoc.

WESTERN OIL & GAS ASSOCIATION, 850 Roosevelt Bldg., 727 W. 7th St., Los Angeles 90017 — (213) 627-4863 — Arthur O. Spaulding, Vice Pres. & Gen. Mgr.; Robert N. Harrison, Asst. Gen. Mgr.

1. Government/Regulatory Agencies

CALIFORNIA INDEPENDENT PRODUCERS ASSOCIATION, 12062 Valley View St., Suite 201, Garden Grove 92645 — (213) 594-8639, (714) 895-2525 — Stephen E. Berg-Hansen, Exec. V.P.; Charles H. Jones, Jr., Pres., (213) 436-9918; Paul L. Howard, Chairman of Bd., (714) 554-7800; Robert E. Brain, Secy., (213) 834-4411; Edward Gladish, Treas., (303) 779-2509; Lee C. McFarland, V.P., L.A. Div., (213) 944-0181; Richard Bennett, V.P. San Joaquin Valley Div., (805) 398-5100; Ronald D. Leineke, V.P. N. Cal. Div., (916) 482-2874; Galen N. Shirley, V.P. Coastal Div., (213) 944-0311; Charles E. Malmgreen, Asst. V.P., (714) 895-2525, (213) 594-8639.

CONSERVATION COMMITTEE OF CALIF. OIL PRODUCERS, 930 Subway Terminal Bldg., 417 S. Hill St., Los Angeles 90013 — (213) 625-7731 — Arthur E. Uhl, Mgr.

CORPORATION COMMISSIONER, Dept. of Corporations, Calif. LOS ANGELES DIST.: 600 S. Commonwealth Ave., 16th Floor, Los Angeles 90005 — (213) 736-3481. SAN FRANCISCO DIST.: 1390 Market St., San Francisco 94108 — (415) 557-3787. SAN DIEGO DIST.: 1350 Front St., San Diego 92101 — (714) 236-7341. SACRAMENTO DIST.: 1025 P St., Sacramento 95814 — (916) 445-7205.

FAULKNER AGENCY, INC., THE, Complete Insurance Service, 508 Center St., Box 1125, Taft 93268 — (805) 765-4165.

HARTIGAN PERSONNEL SERVICES, 2600 Mission St., San Marino 91108 — (213) 682-2856, Telex 67-5493.

INTERNATIONAL ASSOCIATION OF DRILLING CONTRACTORS (IADC), Pacific Coast Region, PO Box 231, Montrose 91020 — (213) 249-1426 — Jack Skeehan, Special Repr.

INTERNATIONAL UNION OF OPERATING ENGINEERS, Local No. 12, 3055 Wilshire Blvd., 3rd Floor, Los Angeles 90010 — (213) 380-4120.

PACIFIC ENERGY ASSOC., 2121 East 38th St., Vernon 90058 — (213) 233-3291 — Arthur H. Rumsey, Managing Director.

PATRICIA'S EMPLOYMENT AGENCY, 2919 Gardena Ave., Signal Hill 90806 — (213) 595-7658 — Patricia Moynihan, Consultant.

SANTA BARBARA COUNTY — PETROLEUM DEPT., 1110 E. Clark Ave., Suite L, Santa Maria 93454 — (805) 937-7279 — Michael J. Niblett, Petr. Specialist; Roy Ormsby, Petr. Inspector; Diane Lang, Petr. Tech.

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H. R. Olilang, Engr.
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D. P. Lande, Engr.
R. H. Samuelian, Engr.
R. C. Manuel, Engr.
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D. R. Clark, Engr.
D. J. Tuttle, Engr.
W. F. White, Engr.
D. C. Mitchell, Engr.
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DISTRICT 5 — 466 N. 5th St., Coalinga 93210 — (209) 935-2941.
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STATE OF CALIFORNIA, Dept. of Industrial Relations: DIV. OF OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION, 525 Golden Gate Ave., 3rd Floor, San Francisco 94102 — (415)

2. Drilling Companies

ALMGREN, GEORGE E., CORP., George E. Almgren, Pres., 7700 Downing Ave., Bakersfield 93308 (Mailing Address: 7512 Kimberly Ave.) — (805) 393-2610.

ATLANTIC OIL CO., 523 W. Sixth St., Suite 1116, Los Angeles 90014 — (213) 624-8741 — Chester F. Dolley, Pres.; J. Russell Sherman, Exec. Vice Pres.; Ernest L. Dolley, Secy-Treas. PARAMOUNT OFFICE: 5660 Paramount Blvd., Paramount 90723 — (213) 633-5151 — Paul P. Stroud, V.P. & Drlg. Supt.

BARNES CORE DRILLING CO., 1350 Roberts Lane, Bakersfield 93308 — (805) 399-9181 — Doyle Barnes, Owner.

BAWDEN, PETER, DRILLING INC., R. K. Irvine, Pres.; A. E. Dumont, Sr., V.P. of Operations. CALIFORNIA DIVISION OFFICE: 12832 Valley View St., Suite 210, Garden Grove 92645 — (714) 898-0491 — F. E. "Slim" Hargiss, V.P./Gen. Mgr.; G. A. Kurtz, Controller; C. D. McKee, Contracts Mgr.; D. E. Wilson, Drlg. Supt.; J. T. Gastineau, Field Supt.; R. E. Shryne, Jr., Maint. Mgr.; J. D. Santillan, Human Resources Mgr.

BIG CHIEF DRILLING CO., a Subsidiary of Entex, Inc., PO Box 14837, 601 N.E. 63rd St., Oklahoma City, OK 73113 — (405) 843-5721 — Wm. A. Glass, Pres.; LeRoy Kenney, Operations Mgr.; Max Bennett, Contract Mgr.; Jim Caughey, Larry Stockwell, Drlg. Supts.; W. W. Lupton, Contract Rep., 16882 Morse Circle, Huntington Beach 92649 — (213) 592-2754.

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CAL PACIFIC DRILLING CO., 333 N. Lantana, #285, Camarillo 93010 — (805) 987-8721.

CENCAL DRILLING, INC., PO Box 936, Bakersfield 93302 — (805) 325-6141 — William F. Patton, Pres.; C. M. Harbin, Vice Pres.

CLEVELAND DRILLING CO., 3131-A Fairhaven Dr., Bakersfield 93308 — (805) 395-0233.

COASTAL DRILLING CO., 2157 Mohawk St., PO Box 5787, Bakersfield 93388 — (805) 589-0210 — Ken Jones, Pres.; Mark Smith, Personnel; Joe Peterman, Purchasing. From Taft: (805) 763-1331.

FINLEY OILWELL SERVICE, INC., 2945 Junipero Ave., Long Beach (Mailing address: PO Box 2945, Santa Fe Springs 90670) — (213) 595-4505 — E. W. Wellbaum, Pres.; John H. Kramer, Vice Pres., Drlg. Operations; L. O. "Pat" Welch, Vice Pres., Prod. Operations; R. E. Hodges, Safety Director. YORBA LINDA: (714) 528-7044 — Ron Lindsay, Asst. Prod. Mgr.

FLUOR DRILLING SERVICES, INC., 3333 Michelson Dr., Irvine 92730 — (714) 975-2000. Telex 68-1441.

GARY DRILLING CO., 7001 Fruitvale Extension, PO Box 5218, Bakersfield 93308 — (805) 589-0111 — Edward Green, Pres.; License No 222619; Gary Green, Office Mgr.; Preston Hale, Bidding Supt.; Don Jenkins, Field Supt.; Bill Ware, Asst. Supt.

GLOBAL MARINE DRILLING CO., 2151 Allesandro Dr., Ventura 93001 — (805) 653-1321

GOLDEN STATE DRILLING, INC., 3312 Fruitvale Ave., Bakersfield 93308 — (805) 589-0730 — Philip F. Phelps, Pres., (805) 393-8271

GRAHAM, PAUL, DRLG. & SERVICE CO., PO Box 822, Rio Vista 94571 — (707) 374-5123 or 374-6361 — Kevin Graham, Vice Pres

H & W DRILLING INC., PO Box 1851, El Centro 92244 (619) 353-5440 — Frank Welch, Vice Pres. & Gen. Mgr.; Virgil Welch, Drlg. Supt

HEXADYNE ENERGY CORP., PO Box 1239, Woodland 95695 — (916) 666-3200 — Joel Hollingsworth, Pres.; Gary (Tex) Hillmon, Vice Pres.; Pete Cox, Drlg. Supt.

HUNNICUTT & CAMP DRILLING CO., a Div. of Monterey Holding Inc., Box 399, Rio Vista 94571 — (707) 374-2425 — Rershel L. Camp, Pres.

HYLTON DRILLING CO., 7700 Downing, Bakersfield 93308 (Mailing Address: Box 9307, Bakersfield 93389) — (805) 589-2062 — Reese Hylton, Corp.; Bob Hylton, Corp. Res., (805) 589-2062; George Almgren, Corp., (805) 393-2610 or 589-2062.

K-B DRILLING & PRODUCTION SERVICE, PO Box 1244, Taft 93268 — (805) 763-5106.

2. Drilling Companies

KELLOGG, K. L., & SONS, Suite 370 Cerritos Square, 4220 Long Beach Blvd., PO Box 7053, Long Beach 90807 — (213) 422-1247 and 636-7867 — J. K. Kellogg and F. N. Kellogg. Bakersfield Office: 3500 Fruitvale Ave., Bakersfield 93308 — (805) 589-0758 — R. N. Kellogg.

KENAI DRILING — WEST COAST — PO Box 2248, Orcutt 93454 — (805) 928-1701 — H. C. Crist, Vice Pres.

LLOYD DRILLING CO., Box 355, Taft 93268 — (805) 765-4271 — Glen Lloyd and John Hollingsworth, Co-Owners.

LOFFLAND BROS. CO., 3919 Rosedale Hwy., PO Box 418, Bakersfield 93302 — (805) 327-4695 — R. S. Cameron, Div. Mgr.; G. D. Anderson, Drlg. Supt.; Coe McElmurry, Div. Engr.

MARLIN-WEST DRILLING CO., INC., PO Box 551, Bakersfield 93302 — (805) 327-8304 — Michael Fisher, Operations Mgr.; Jack McKay, Drlg. Supt.; James Posey, Jr., Maint Supv.

PLYLER OIL OPERATIONS, 3011 Olympic Dr., Oildale 93308 — (805) 399-1348 — Ray Plyler.

POOL OFFSHORE COMPANY, 1695 Mesa Verde, Ventura 93003 — (805) 644-9591 — K. L. Albiston, Gen. Mgr.; B. J. Hayes, Drlg. Mgr. SIGNAL HILL OFFICE: 2633 E. 28th St., Suite 602, Signal Hill 90806 — (213) 427-7956 — R. G. Baldwin, Drlg. Supt. Contractor's Lic. #424755.

REPUBLIC DRILLING CO., 2945 Junipero Ave., Long Beach (Mailing address: PO Box 2945, Santa Fe Springs 90670) — (213) 595-4505 — E. W. Wellbaum, Pres.; John H. Kramer, Vice Pres., Drlg. Operations; L. O. "Pat" Welch, Vice Pres., Prod. Operations; R. E. Hodges, Safety Director; Vurtis McDowell, Drlg. Supt.

RANKIN DRILLING CO., 626 E. Casa Loma Dr., Bakersfield 93307 — (805) 832-5819.

SANTA FE DRILLING CO. (A Subsidiary of Santa Fe International Corp.) 505 S. Main St., PO Box 1401, Orange 92668 — (714) 558-1300.

SHERIDAN DRILLING, INC., Box 1851, Bakersfield 93303 — (805) 397-6536 — D. M. Sheridan, A. E. Sheridan.

THOMPSON DRILLING CO., 4 Corporate Plaza Dr., Suite 102, Newport Beach 92660 — (714) 644-9292 — Robert H. Thompson, Pres.; James L. McBride, Drlg. Supt.

TRIDENT DRILLING INC., 3215 Fairhaven Dr., Bakersfield 93308 — (805) 323-3193 — R. E. Frasch, Pres.; Lee Lamberson, Gen. Mgr.

WESTERN OFFSHORE DRLG. & EXPL. CO., 3333 Michelson Dr., Irvine 92730 — (714) 975-7008 — R. A. McClintock, Chairman; J. R. Fluor II, Pres.; R. F. Woidneck, Sr. Vice Pres.; J. A. Sage, Sr. V.P.-Marketing; R. W. Walker, V.P.-Operations; B. J. Turner, V.P.-Equip. & Purchasing; J. H. Dunn, V.P.-Safety; J. W. Lovett, Marketing Rep.; D. M. Haralson, Asst. Mgr.-Operations; R. E. Kreuger, Sr. Project Mgr

3. Operating Companies

AMINOIL INC.
Company Headquarters:
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Mailing: PO Box 94193, Houston, TX 77292
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Company Officers:
Chairman and Chief Executive Officer, George E. Trimble
President and Chief Operating Officer, J. B. Coffman
Executive Vice President-Finance and Administration, Paul W. Cain
Exec. VP-Exploration, T. M. Hamilton
Exec. VP-Marketing, J. P. (Jack) McCloskey
Exec. VP-Intl. Operations, Robert S. Petty
Exec. VP-Domestic Operations, H. Pat Riley
VP and Controller, Donald G. Barber
VP-Eastern Region, Roger L. Billings
VP & General Counsel, Robert A. Bussian
VP-Tax, Joseph E. Day
VP-Natural Gas Processing, J. T. Devins
VP-Production, William L. Donnelly
VP-Western Region, Theodore W. Ehring
VP and Treas., Jimmie T. Glover
VP-Public Relations, Joseph S. Helewicz
VP-Public Affairs, Nick L. Laird
VP-Crude Oil & Products Marketing, Harry A. Nester
VP-Intl. Exploration, Thomas E. O'Connor
VP-Business Planning & Development, Frank R. Power
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Western Region Operations—Oil and Gas:
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ARCO OIL & GAS COMPANY
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Robert Flaherty, Vice Pres.-Dist. Mgr.
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H. S. Jenkins, Employee Relations Mgr.
C. C. Lowe, Jr., Operations Mgr.
C. D. Owens, Engineering Mgr.
W. W. Reeves, Land Mgr.
David Woltz, Exploration Mgr.
J. M. Trickey, Prod. Supt.
D. J. Ruckel, Drilling Supt.
H. E. Wold, Gas Plants Supt.
L. A. Worneski, Materials Director

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3. Operating Companies

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W. H. Pistole, Div. Operations Mgr. (Alaska)
D. E. Cornett, Div. Environmental Manager
J. C. Orchard, Div. Engineering Manager
W. W. Echert, Equity Coordinator — PBU
E. M. Causey, Div. Accounting Manager
E. F. Sabatka, Div. Production Geologist
G. T. Theriot, Div. Reservoir Engineer
W. D. Smith, Div. Production Engineer
L. T. Morton, Production Engineer
T. H. Meadows, Jr., Div. Civil Engineer
C. Burks, Div. Public Relations Manager
D I Bolding, Div. Public Relations Manager
G. L. Palmer, Employee Relations Manager
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VENTURA PRODUCTION DISTRICT OFFICE
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GETTY OIL COMPANY (Continued)
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J. L. Pauley, Div. Prod. Mgr.
N. J. Kappeler, Div. Expl. Mgr.
H. W. Rodges, Div. Landman
L. M. Pickett, Div. Public Affairs Mgr.
F. C. Fuller, Gas & Gasoline Plants Mgr.
D. L. Gallaher, Div. Environmental Affairs Coor.
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T. J. Hurst, Dist. Engr.
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J. K. Haushalter, Area Supt. Kern River Facil.
M. F. Weller, Area Supt. Kern Front
R. Elias, Lead Reservoir Engr.
M. A. Carrell, Lead Petroleum Engr.

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D. E. Wittig, Dist. Engr.
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A. Robert Abboud, Pres. & Chief Oper. Officer
Zoltan Merszei, Vice Chmn. of the Board & Dir.; Chmn. of the Board & Chief Exec. Officer of Hooker Chemical Corp.
Donald L. Baeder, Exec. V.P., Science & Tech.
Stonie Barker, Jr., Exec. V.P.; Pres. & Chief Exec. Officer of Island Creek Coal Co.
Alexander Crosan, Exec. V.P.
John J. Dorgan, Exec. V.P.-Fin. & Chmn. of the Investment Review Committee.

3. Operating Companies

OCCIDENTAL PETROLEUM (Continued)

Albert Gore, Exec. V.P.; Chmn. of the Board of Island Creek Coal Co.
Paul C. Hebner, Exec. V.P. & Secy.
Thomas D. Jenkins, Exec. V.P.; Pres. & Chief Oper. Officer of Occidental Oil & Gas Corp.
Angelo Leparulo, Exec. V.P.-Operations
Robert L. Peterson, Exec. V.P.; Chmn. & Chief Exec. Officer, Iowa Beef Processors, Inc.
Robert D. Richley, Exec. V.P.-Admin.
Gerald M. Stern, Exec. V.P. & Sr. Gen. Counsel
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R. H. Vaughan, Exec. V.P., Worldwide Expl.
Guy H. Watkins, Exec. V.P.; Pres. & Chief Oper. Officer, Hooker Chemical Corp.
Martin Berger, Sr. V.P., Research & Dev.
Norman D. Alexander, V.P.-Corporate Affairs
Ronald H. Asquith, V.P.-Employee Rel.
Ronald B. Casriel, V.P. & Treas.
Peter J. Coyle, V.P.
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MILLER, R. BRUCE, 5505 Cypress Point Dr., Bakersfield 93309 — (805) 833-9862.

MITTELHAUSER CORP., 22691 Lambert St., Suite 506, El Toro 92630 — (714) 951-6162 — Harry J. Takach, Director Environmental Engr.; Garrett E. Pack, Director Process Engr.

MOON, JAMES, 18851 Muriel Place, Santa Ana 92705 — (714) 544-2133. Reg. No. M-3862.

MORROW, TOM, PO Box 491, Verdugo City 91046 — (213) 249-3652. Reg. No. P409.

NAHAMA & WEAGANT ENERGY CO., Rodney Nahama & Frank E. Weagant, 602 H St., Bakersfield 93304 — (805) 323-9075.

NAPPER & McGOWAN, 420 W. Southwood Dr., Woodland 95695 — (916) 662-4541 — Jack E. Napper, Reg. Geol. 3037; Verne L. McGowan, Reg. Geol. 1431.

NEEL, HENRY H., 802 Roosevelt Bldg., 727 W. 7th St., Los Angeles 90017 — (213) 622-6968. Calif. Reg. P.E. 183, Geol. No. 11, AIPG.

NELSON, ALLEN C., 313 College Park Dr., Seal Beach 90740 — (213) 431-4529. Reg. Petr. Engr. Calif. No. 1180.

NISKANEN, HENRY W., 4008 Reno Lane, Bakersfield 93309 — (805) 831-7959.

NOONAN, BRUCE, 8201 Jason Ave., Canoga Park 91304 — (818) 340-3737. C. P. L. Certification #15.

4. Consultants

NYBO & WALKER ENGINEERING-SURVEYING, 4200 Easton Dr., Suite 2, Bakersfield 93309 — (805) 395-3113 — L. Bruce Nybo, R.C.E. 28849; Ron Walker, L.S. 4761.

O'DONNELL, WILLIAM J., 3325 Purdue Dr., Bakersfield 93306 — (805) 871-0746.

OILFIELD DATA RESEARCH, 3720 Easton Dr., Suite 5, Bakersfield 93309—(805) 325-8155—Tami Moosios, Owner.

OLSEN, H. T., 3760 Ranch Top Rd., Pasadena 91107 — (213) 351-9487.

OLSON, ELMER A., PO Box 137, Whittier 90608 — (213) 693-4901. Reg. No. P.E. 941.

PARAGON PETROLEUM CONSULTANTS, Union Bank Tower, 21515 Hawthorne Blvd., Suite 500, Torrance 90503 — (213) 540-1215 — Lisa A. Curci, Chief Geologist, C.P.G.S. 6298.

PARKER, FRANK S., 30 N. Raymond Ave., Room 408, Pasadena 91101 — (213) 793-0583. Reg. Nos. Petr. Engr. 583, Geol. 190.

PARKER, WALTER F., 4055 Wilshire Blvd., Los Angeles 90010 — (213) 386-6171.

PAYNE, MAX B., 1805 Warwick Rd., San Marino 91108 — (213) 282-3645. Reg. No. 191.

PEPPER, MILES W., 8020 Morningside Dr., Loomis 95650 — (916) 791-0565. C.R.G. No. 733.

PETROLEUM CONSULTANTS, INC., 29 Kendall St., Redlands 92372 — E. "Pick" McIver, Pres. — (714) 792-5906.

PETROLEUM ECONOMIC ANALYSIS, 2509 Colt Rd., Rancho Palos Verdes 90274 — (213) 514-1516.

PETROLEUM INDUSTRY CONSULTANTS, INC., 5455 Garden Grove Blvd., Westminster 92683 — (714) 898-6399 — Thomas H. Benton, Jack E. Curtis, Oliver R. Henrickson, Ralph T. Thompson, Sherwin D. Yoelin.

PICKRELL, DANIEL J., 1408 Chapin Ave., PO Box 384, Burlingame 94010 — (415) 344-1189. C.P.G. No. 651.

R & M CONSULTANTS, INC., 19700 Fairchild, Suite 180, Box 16187, Irvine 92713 — (714) 833-0843.

QUINN, ROBERT V., 3845 Stockdale Hwy., Rm. 120, Bakersfield 93309 — (805) 397-1202. License P.E. 196.

RECTOR, MICHAEL R., 1415 - 18th St., Suite 708, Bakersfield 93301 — Office (805) 322-8206, Res. (805) 322-7517. C.P.G. No. 613, Cal Certificate No. 78.

RENNIE, E. W., JR., INC., 200 New Stine Rd., Suite 105, Bakersfield 93309 — (805) 397-1370. Calfi. Reg. Geol. No. 85.

REYNOLDS, SARGENT M., 1316 Jimeno Lane, Box 737, Woodland 95695 — (916) 662-1002. Reg. Geol. 976.

REYNOLDS, SARGENT T., PO Box 737, Woodland 95695 — (916) 662-7749. Reg. No. 131, CPG 1416.

RICHARDSON, ROBERT L., INC., 1147 E. Main St., Ventura 93001 — (805) 648-4996 — Robert L. Richardson, Pres., Reg. Petr. Engr. No. 1038, Reg. Geol. No. 1647; Res. (805) 642-2973 — Steven M. Curran, Dev. Engr.

ROBERTSON, JOHN O., 4244 Live Oak St., Cudahy 90201 — (213) 773-3042 — Reg. No. P-1375.

ROBINSON, OLIVIA G., 615 S. Flower St., Suite 1900, Los Angeles 90017 — (213) 621-2056.

ROBINSON, PATRICK, 7969 Madison Ave., #202, Citrus Heights 95610 — (916) 961-1390. Reg. Geol. #3554.

ROPE INC., Imperial Square, Suite 209-B, 12631 E. Imperial Hwy., Santa Fe Springs 90670 — (213) 863-7273 — E. E. "Swede" Jensen, Pres.; Phillip G. Cook, Vice Pres. HOUSTON, TX: (713) 789-4429.

ROTH, GEORGE H., & ASSOC., 5437 Laurel Canyon Blvd., North Hollywood 91607 — (213) 877-0749 — George H. Roth, Reg. No. 1496.

ROWLAND, HAROLD L., 347 Petroleum Bldg., 714 W. Olympic Blvd., Los Angeles 90015 — (213) 749-4616.

RUHLE, JAMES L. & ASSOCIATES, 2535 E. Balfour Ave., Fullerton 92631 — (714) 526-6120.

RUSSELL, RICHARD C., 1538 N. Century Blvd., Santa Ana 92703 — (714) 554-7800. Reg. Pet. Engr. No. 1236.

RYAN, GEORGE PARKER, 647 Winston, San Marino 91108 — (213) 681-7247. Reg. No. 528.

SAWABINI SERVICES, INC., Box 80373, San Marino 91108-8373 — (818) 287-7215 — Telex 696-163, Cable ELFNAFTA SMAR, Reg. No. P-1321.

SCHLAX, WILLIAM N., 508 Buena Vista Dr., Santa Rosa 95404 — (707) 542-0837. Engr. Geol. Reg. No. 28.

SCOTT, ROBERT NEIL, 2201 F St., Bakersfield 93301 — (805) 323-0074. If no answer phone (805) 871-5798. State of Calif. License 2204.

SEIDEN, HY, 1401 Ming Ave., Bakersfield 93304 — (805) 831-6727. C.P.G. No. 531.

SHEEHAN, CLIFFORD, JR., 713 Buck Ave., Vacaville 95688 — (707) 446-7708.

SHEPARD, DEAN W., 3121 Camino Ave., Hacienda Heights 91745 — (213) 968-4287 or (213) 628-3221. Reg. No. 1149.

SHEPARD, MARLAN, 674 County Square Dr., Suite 101, Ventura 93003 — (805) 644-5480.

SIMONSON, RUSSELL R., 1605 Glorietta Ave., Glendale 91208 — C.P.G. No. 971; P.E. No. 731 — Phone (213) 243-3093.

SMITH, DONALD M., 13282 LaVaughn Dr., Garden Grove 92644 — (714) 537-4275. Reg. No. 406. (Drlg. & Prod.)

SMITH, E. RANDOLPH, PO Box 275, Kerman 93630 — (209) 846-7869. Reg. No. 204.

4. Consultants

SMITH, JEFF & ASSOC., INC., 2700 K St., Bakersfield 93301 — (805) 327-4031. Calif. Reg. Geol. 3362.

SOLUM, JAMES R., Ph.D., 16842 Baruna Lane, Huntington Beach 92649 — (714) 846-9598 or (213) 493-2481. State of Calif. Engr. Lic. M-O 11131.

SPIVAK, ALAN, Ph.D., 2501 La Condesa Dr., Los Angeles 90049 — (213) 471-2750.

STAR RESOURCES, INC., 5100 California Ave., Suite 222, Bakersfield 93309 — (805) 327-7751 — William D. Newsom, Pres.

STEIN, RAY, PO Box 3085, El Macero 95618 — (916) 758-3260. Reg. 743, CPG 1077.

STEVENSON, ALBERT, 730 Santiago Ave., Long Beach 90804 — Bus. Phone (213) 498-3142, Res. (213) 438-0461 — Mrs. Artie Stevenson, John A. Severson.

SUMMY, R. K., 5530 The Toledo, Long Beach 90803 — (213) 433-1214.

SUMPF, ROBERT, 900 Wilshire Blvd., Room 618, Los Angeles 90017 — (213) 628-1261.

TAIT & ASSOCIATES, INC., Architects/Engrs., 900 Orangefair Lane, Anaheim 92801 — (714) 870-1253, (213) 860-6505 — Vince Tock, Pres.

TATUM, CHARLES R., Petroleum Consultant, 1901 E. Lambert Rd., Suite 108, LaHabra 90631 — (213) 694-1047.

TEBERG, JOHN A., 26133 Hatmor, Calabasas 91302 — (213) 880-4789. P.E. 1158. Field Office: PO Box 272, Huntington Beach 92648 — (714) 847-4044.

THOMAS, G. B., 7376 W. 88th St., Los Angeles 90045 — (213) 670-1349. Calif. No. 201, Texas No. 10432, Okla. No. 2613.

THOMSON, JOHN N., 2612 Elm St., Bakersfield 93301 — (805) 325-6892.

TRAXLER, J. D., 12655 W. Washington Blvd., Suite 106, Los Angeles 90066 — (213) 390-8603, Res. (213) 454-5256. C.P.G. No. 24.

UNITED HYDROCARBON CORP., 1212 Garden, #2, San Luis Obispo 93401 — (805) 540-8374 — Wm. W. Perrine, Pres.; Donna Dougherty, Vice Pres. (Geological Consultants.)

VAN WINGEN & MENDOZA, 712 Fair Oaks Ave., South Pasadena 91030 — (213) 682-2479 — N. van Wingen, Reg. P.E. 114; Joseph J. Mendoza, Reg. P.E. 1111.

VISSER, ROBERT C., CONSULTANTS INC., 1650 S. Pacific Coast Hwy., Suite 200, Redondo Beach 90277 — Office: (213) 316-5934; Res.: (213) 541-9090.

WALDREN, JAY, 3131 Audubon Dr., Bakersfield 93301 — (805) 324-5019.

WALKER, E. W. "Bill," 1634 N. Grand Oaks Ave., Pasadena 91104 — (213) 797-0644. Reg. No. M1384.

WALKER, RICHARD A., 125 W. Victoria, Gardena 90248 — (213) 532-3419. Reg. No. 1094.

WALLACE, JOHN P., 48 Shady Vista Rd., Rolling Hills Estates 90274 — (213) 377-2991. Reg. No. P-504.

WEDDLE, JAMES R., 1400 Easton Dr., Suite 133, Bakersfield 93309 — (805) 395-3029. Calif. Reg. Geol. No. 45.

WEST, JACK C., 515 W. Commonwealth Ave., Suite 206, Fullerton 92632 — (714) 525-3366. Res. (714) 521-0788.

WESTERN PETROLEUM CONSULTANT INC., D. W. "Tex" Sanders, Jr., 12807 Lone Star Rd., Auburn 95603 — (916) 269-0751.

WESTMONT MANAGEMENT CORP., 11340 W. Olympic Blvd., Suite 175, Los Angeles 90064 — (213) 479-3734.

WHEELER, HERBERT E., JR., 2775 Cottage Way, Suite 24, Sacramento 95825 — (916) 485-2715. Reg. Pet. Engr. No. 1292.

WHITEHOUSE & ASSOC., 3532 Katella, Los Alamitos 90720 — (213) 598-1377.

WILLIAMS, STANWOOD I., 30 N. Raymond Ave., Room 510, Pasadena 91103 — (213) 792-6028 and 792-6029.

WILLIS, THEODORE H., 237 S. Euclid St., Pasadena 91106 — (213) 796-5954. Reg. Geol. No. 449.

WITTER, GEORGE G., 270 Los Angeles World Trade Center, 350 S. Figueroa St., Los Angeles 90071 — (213) 624-1311. Calif. Reg. Geol. No. 439.

WNGCO INTERNATIONAL, INC., 645 S. State College Blvd., Suite A, Fullerton 92631—(714) 871-3012.

5. Refineries

ATLANTIC RICHFIELD CO., 515 S. Flower St., Los Angeles 90017 — (213) 486-3511. Watson Refinery: 1801 E. Sepulveda Blvd., Carson 90745 — (213) 548-8000 — N. E. Pennels, Mgr.; T. W. Kunkel, Mgr. Opns.; M. M. Owens, Mgr. Qual. Adm.; W. T. Roberts, Mgr. Environmental & Energy Conservation; J. I. Day, Mgr. North Operations; N. L. Nielsen, Mgr. South Operations; C. R. Adams, Mgr. Engr.; M. A. Prosche, Mgr. Refinery Technology; G. G. Mussie, Mgr. Admn. Services; G. W. Pauly, Mgr. Maintenance; C. C. Hitchcock, Mgr. Fire & Safety.

BEACON OIL CO., 525 W. 3rd St., Hanford 93230 — (209) 582-0241 — V. L. Anderson, Chairman; D. E. Bacigalupo, Pres.; H. O. Stevenson, Sr. V.P.; J. H. Leonard, V.P Refining; Derek Garman, Purchasing Mgr

CHAMPLIN PETROLEUM CO., Refinery at 2402 E. Anaheim, Wilmington 90744 — (213) 436-4261 — T. J. Bornaugh, Refinery Mgr.; J. D. Mackey, Mgr. Tech. Services.

CHEVRON U.S.A. INC., Mfg. Dept. 575 Market St., San Francisco 94105 — (415) 894-7700 — R. S. Proctor, Vice Pres.; O. T. Buffalow, Gen. Mgr. Technical; J. N. Sullivan, Gen. Mgr. Operations; J. W. Leader, Coordinator Fac. Planning; J. P. Gegner, Coordinator Planning; F. M. Parker, Coordinator Environmental & Govt. Affairs; A. S. Meyer, Economic Analyst; R. E. Kenyon, Maintenance Coordinator; G R Movvitt, Operations Coordinator. REFINERIES: Alaska, R. E. Williams, Mgr.; Bakersfield, S. A. Furbacher, Mgr.; El Paso, J. C. Keating, Mgr.; El Segundo, C. P. Mehlum, Gen. Mgr.; Hawaii, M. E. Hagler, Mgr.; Pascagoula, P. E. Ruhter, Gen. Mgr.; Perth Amboy, C. L. Orman, Acting Mgr.; Richmond, J. K. Murray, Gen. Mgr.; Salt Lake, M. D. Hannan, Mgr.

COASTAL PETROLEUM, INC., 14711 Bentley Circle, Tustin 92680 — (714) 730-5999 — Morris V. Hodges, Pres.; Paloma Refinery, (805) 834-5560.

COLINE GASOLINE CORP., 5555 W. Pacific Coast Hwy., Ventura 93001 — (805) 643-6628 — F. E. Faria, Gasoline Plant Supt.

DeMENNO RESOURCES, 2000 N. Alameda, Compton 90221 — (213) 537-7100.

DOUGLAS OIL CO., 3160 Airway, Costa Mesa 92626 — (714) 540-1111 — John J. Stanko, Pres.; D. J. McNutt, Exec. Vice Pres.; G. E. Clark, Vice Pres., Transportation & Supply; A. L. Cleveland, Vice Pres.; R. W. Irwin, Vice Pres., Wholesale Mktg.; W. L. Martin II, Vice Pres., Retail Mktg.; F. N. Dawson, Jr., Dir. Mfg.; R. M. Akers, Dir. Employee Rel.; L. J. Janecek, Secy., Dir. Planning; R. S. Hodgson, Dir. Research & Technology; R. E. Boydston, Ch. Engr.; K. K. Wright, Purch Agent. REFINERIES: 14700 Downey Ave., Paramount 90724 — (213) 531-2060; 1660 Sinton Rd., Santa Maria 93454 — (805) 922-5871 — T. J. Vaughn, Supt.

ECO PETROLEUM, INC., 2633 Cherry Ave., Signal Hill 90806 — (213) 595-5758.

EDGINGTON OIL CO., INC., 2400 E. Artesia Blvd., Long Beach 90805 — (213) 423-1465; from L.A., 636-2524 — Mark Newgard, Pres. & CEO; Martin Simon, Exec. V.P. Marketing/Mfg.; Herb Stevens, V.P. Finance & Administration; Al Siegner, V.P. Supply & Trading; Richard Kent, V.P. Products; Clay Corwin, Secretary & General Counsel; Wm. J. Tomsic, V.P. Mfg.; Garry Pealer, Controller; John Sculati, Director of Planning; Douglas Gossoo, Mfg. Refy. Oprs.; Donald L. Ring, Dir. of Purchasing. LONG BEACH REFINERY.

EXXON COMPANY, U.S.A., Benicia Refinery, 3400 E. 2nd St., Benicia, CA 94510 — (707) 745-7011 — A. W. Atkiss, Refinery Mgr.

FLETCHER OIL & REFINING CO., 24721 S. Main St., Box 548, Wilmington 90748 — (213) 518-4270, (213) 775-3731 — Robert G. Fletcher, Pres.; D. S. Fletcher, Vice Pres.; W. D. Fletcher, Secy-Treas. & Purch. Agent; Jack Willis, Marketing; J. Craig Norton, V.P. Finance; R. D. Erdman, V.P. Manufacturing; M. T. Irwin, Refinery Mgr.; John Armstrong, V.P. Supply & Distribution.

GOLDEN BEAR DIV., Witco Chemical Corp., 10100 Santa Monica Blvd., Los Angeles 90067 — (213) 277-4511 — Robert L. Feldman, V.P. & Gen. Mgr.; C. E. Morgan, Ref. Mgr., PO Box 5446, Oildale 93388 — (805) 393-7110.

GOLDEN EAGLE REFINING CO., INC., 707 Wilshire Blvd., Los Angeles 90017 — (213) 624-7841. REFINERY: 21000 S. Figueroa, Carson 90744 — (213) 320-6860.

GOLDEN WEST REFINING CO., 13539 E. Foster Rd., Santa Fe Springs 90670 — (213) 921-3581.

HUNTWAY REFINING CO., Box 1257, 1651 Alameda St., Wilmington 90744 — (213) 518-4000 — Juan Forster, Pres.; Robert Monson, Mgr. of Operations; Lorrie Lanneau, Office Mgr.

KERN OIL & REFINING CO., Rt. 6, Box 336, Bakersfield 93307—(805) 845-0761—B. W. Cogswell, V.P. Mfg., 100 Oceangate, Suite 1010, Long Beach 90802 — (213) 775-2281, 436-0685 — D. S. Cish, Pres.; A. Kernicks, V.P. Crude Oil Supply; T. R. Bryan, Mgr. Product Supply.

LOMITA GASOLINE CO. (Wholly Owned Subsidiary of Petrolane, Inc.), 2901 Orange, PO Box 851, Long Beach 90801 — (213) 424-1693. Natural Gasoline Plants: Long Beach and Signal Hill — A. van Os, Gen. Mgr.; R. W. Herbold, Field Supt.; J. E. Shaddock, Plant Supt.; L. J. Mittendorf, Acct. Mgr.

LUNDAY-THAGARD OIL CO., 9301 S. Garfield Ave., South Gate 90280 — (213) 773-4244. Harold Howard, Landman.

MACMILLAN RING-FREE OIL CO., INC., 911 Wilshire Blvd., Suite 1680, Los Angeles 90017 — (213) 622-2241 — R. W. Matson, Vice Pres., Calif. Div. ACCOUNTING OFFICE: 2365 E. Sepulveda Blvd., Carson 90810 —(213) 595-4695. J. Murphy, Comptroller. REFINERY: 2020 Walnut Ave., Signal Hill 90806 — (213) 424-8515, 636-2535 — John Beckban, Refinery Mgr.; H. L. Soto, Refinery Supt.; E. A. Cannou, Maint. Supt.; R. R. Seeliger, Pipeline Supt.

5. Refineries

MARATHON OIL CO., Natural Gasoline & Cycling Plant, South Coles Levee Field, PO Box 2348, Bakersfield 93303 — P. F. Patterson, Operations Supt., (805) 325-5701; T. L. Breninger, Plant Supt.

MARLEX OIL & REFINING CO., 1825 E. Spring St., Long Beach 90806 — (213) 595-5751 — Carl A. Olson, Chairman of the Board; Phillip R. Appleby, Pres. CORPORATE OFFICE: 666 E. Ocean Blvd., Suite 2208, Long Beach 90802 — (213) 436-8121.

MOBIL OIL CORP., 612 S. Flower St., Los Angeles 90054 — (213) 626-5711. TORRANCE REFINERY: 3700 W. 190th St., Torrance 90509 — (213) 328-2550. J. W. Eisenmann, Refinery Mgr.; A. J. DeJoseph, Employee Relations Mgr.; A. T. Spilsbury, Maintenance Mgr.; C. W. Roper, Accounting Mgr. FERNDALE REFINERY: W. D. Robb, Refinery Mgr.; J. C. Bennett, Employee Relations Mgr.; M. E. Tellessen, Operations Mgr.; T. J. Stelly, Technical Mgr.; T. D. Burger, Maintenance Mgr.; R. E. Gogel, Accounting Mgr.

NEWHALL REFINING CO., INC., PO Box 938, Newhall 91322 — (805) 259-2660 — R. J. Kerr, Exec. Vice Pres.; K. T. Kenny, Vice Pres. of Mktg.; H. J. Mangold, Vice Pres., Mfg. Owned by Pauley Petr., Inc.

OXNARD REFINERY, PO Box 258, Oxnard 93032 — (805) 487-4798 — Morley Chase, Chief Ex. Officer; F. W. Bragman, Pres.

PACIFIC REFINING CO., PO Box 68, Hercules 94547 — (415) 799-6600 — Albert L. Gualtieri, Jr., Refinery Mgr.

POWERINE OIL CO., 12354 E. Lakeland Road, Santa Fe Springs 90670 — (213) 944-9861 — Harry R. Rothschild, Chief Exec. Officer and Chairman of the Board; Wm. F. Burke, Pres.; Peter B. Rothschild, Exec. Vice Pres.; Harry S. Rothschild, Secy-Treas.; Harry F. Poll, Vice Pres., Mfg.; Walter I. Weed, Vice Pres., Sales & Supply; W. R. Whittenburg, Vice Pres., Gen. Admin.; Wes Oldaker, Purch. Agent; Eric Maa, Tech. Mgr.; Dave Dragt, Ref. Oper. Mgr.; Bill Steelman, Ref. Maint. Mgr.; Keith Bridwell, Gen. Mgr. Supply/Distr.

SABRE REFINING CO., 3121 Standard, Bakersfield 93308 (Mail Address: Box 2465, Bakersfield 93303) — (805) 327-7451, TWX: 3271197 SABRE BAK.

SAN JOAQUIN REFINING CO., Shell & Standard, PO Box 5576, Bakersfield 93308 — (805) 327-4257 — Newell E. Fait, Pres.; Ted A. Gould, Gen. Mgr.; R. L. Steele, Refinery Supt.; Percy S. Thompsett, Controller; E. R. Starbuck, Chief Chemist; E. W. Spear, Purch. Agent.

SANTA FE ENERGY CO., 5555 W. Pacific Coast Hwy., Ventura 93001 — R. B. Stoyanoff, Plant Supt.

SHELL OIL CO. REFINERIES: Anacortes Refinery: PO Box 700, Anacortes, WA 98221 — (206) 296-3111 — W. A. Malseed, Refinery Mgr. MARTINEZ MANUFACTURING COMPLEX: PO Box 711, Martinez 94553 — (415) 392-5400 — R. M. Kingsbury, Mgr.; R. A. Banducci, Supt. WILMINGTON MANUFACTURING COMPLEX: PO Box 6249, Carson 90749 — (213) 835-5611 — T. E. Innocenzi, Mgr. Wilmington Mfg. Complex; J. W. Armstrong, Supt. Mfg. Complex.

SUNLAND REFINING CORP., Head Office: 9302 Garfield Ave., South Gate 90280 — (213) 773-4244 — Bernard B. Roth, Chairman & C.E.O.; Dale A. Snyder, Pres.; Robt. S. Roth, Vice Pres.; Donald L. Westfahl. Sr., Refinery; Toshiko G. Chan, Secy. BAKERSFIELD REFINERY: PO Box 1345 — (805) 589-9615.

TEXACO INC., 3350 Wilshire Blvd., Los Angeles 90010. Refinery at Wilmington 90744, Box 817 — (213) 835-8261 — D. J. Maffuccio, Plant Mgr.; E. A. Hawkins, Asst. Plant Mgr. NATURAL GASOLINE PLANTS: W. C. Lenz, Div. Mgr.; L. E. Woodruff, Supt. of Plants; Shiells Canyon and Honor Rancho Gasoline Plants, Box 3337, Ventura 93003 — R. F. Vincent, Plant Foreman. PLANTS: Box 7221, Long Beach 90807 — R. H. Thomas, Plant Foreman, Santa Fe Springs and Signal Hill Gasoline.

TOSCO CORP. — AVON REFINERY, Martinez, CA 94553 — L. E. Forbes, Refinery Mgr.; W. E. Redding, Mgr. Admin.; R. N. Johnson, Oper. Mgr.; P. J. Lazzarini, Purch. Mgr.; R. R. Bietz, Maint. Mgr.; D. H. Emanuelson, Engr. Mgr.; C. A. Torbet, Oil Mvt. Mgr.; R. R. Stanislawski, Planning & Econ. Mgr.

UNION OIL CO. OF CALIF., PO Box 7600, Terminal Annex, Los Angeles 90051 — (213) 486-7600. LOS ANGELES REFINERY: 1660 W. Anaheim St., PO Box 758, Wilmington 90744 — (213) 513-7600 — R. F. Miller, Mgr. SAN FRANCISCO REFINERY: Rodeo 94572 — (415) 799-4411 — W. N. Stark, Mgr. SANTA MARIA REFINERY: Rt. 1, Box 7600, Arroyo Grande 93420 — Phone Guadalupe 3134 — O. F. Noss, Supt.

U. S. OIL & REFINING CO., 5150 Wilshire Blvd., Los Angeles 90036 — (213) 938-7156 — William C. Kitto, V.P. Crude Oil Supply; Thomas C. Temple, V.P. Supply & Distribution; Thomas A. Treichel, Mgr. Supply Logistics. REFINERY: 3001 Marshall Ave., Tacoma, WA 98421 — Robert A. Monarch, Pres.; Donald E. Bourn, Chief Exec. Officer.

U.S.A. PETROCHEM CO., 4777 Crooked Palm Rd., Ventura 93001 — (805) 648-3168. Harry A. Lynn, Chairman of the Board; Herb Hill, Sr. V.P.; Joe Pearson, V.P.-Engr.

6. Marine Terminals in Southern California

County	Location	Terminal Operator	Function
Santa Barbara	Cojo Bay (Point Conception)	Union	Onloading crude oil
	Gaviota	Getty	Onloading crude oil
	Elwood	Aminoil	Onloading crude oil
	Carpinteria	Chevron	Onloading crude oil Offloading product
Ventura	Ventura River	Getty	Onloading OCS and other crude oil and natural gasolines
	Ventura	Union	Onloading OCS and other crude oil
	Mandalay Beach	Southern Cal. Edison	Offloading fuel oil
Los Angeles	El Segundo (4 terminals)	Chevron	Offloading crude oil Onloading product
Orange	Huntington Beach	Gulf	Offloading crude oil
San Diego	Encino	San Diego Gas and Electric	Offloading fuel oil

SOURCES: California Office of Planning and Research, 1977; BLM, Pacific OCS Office, 1978

APPENDIX 'M'

CUSTOMHOUSE BROKERS AND TYPICAL BROKER FEES

Custom House Brokers

California (Northern)

P.W. BELLINGALI, INC.
330 Jackson Stret
San Francisco, CA 94120, USA
Tel: (415) 781-8640

CARDINAL INTERNATIONAL
1332 Marsten Road
Burlingame, CA 94010, USA
Tel: (415) 348-3318

THOMAS J. CROWLEY
P.O. Box 2548
South San Francisco, CA
94010, USA
Tel: (415) 583-4030

INTERNATIONAL EXPEDITERS, INC.
9 First Street
San Francisco, CA 94105, USA
Tel: (415) 982-6881

INTERNATIONAL FREIGHT SERVICES
859 Cowan Road
Burlingame, CA 94010, USA
Tel: (415) 692-1632

JOHN R. LINDSAY
1342 Marsten Road
Burlingame CA, 94010, USA
Tel: (415) 348-1232

California (Southern)

INTERAMERICAN WORLD TRANSPORT CORP.
1200 Aviation Boulevard
Hawthrone, CA 90250, USA
Tel: (213) 776-7880

JOHNSON AND ASSOCIATES
313 East Beach Avenue
Inglewood, CA 90302, USA

CASTELAZO AND ASSOCIATES
5420 West 104th Street
Los Angeles, CA 90045, USA
Tel: (213) 776-6031

LUDWIG HERMANN INC.
1213 Arbor Vitae
Inglewood, CA 90301, USA

Alberta

MILNE & CRAIGHEAD
1400 Centennial Bldg.
Edmonton, Alberta
Tel: (403) 429-4241
Tlx: 037-2460

or

4th Flr. 133-6th Avenue S.E.
Calgary, Alberta
Tel: (403) 263-7856
Tlx: 038-22567

H.T. HIGINBOTHAM LIMITED
1910 Centennial Bld.
Edmonton, Alberta
Tel: (403) 423-5444
Tlx: 037-2329

or

580 Fedreal Bldg.
Calgary, Alberta
Tel: (403) 269-5591
Tlx: 038-24560

AMERICANA BROKERS
Sweetgradd, Montanna
Tel: (406) 335-2030

or

SMITH H.H. LTD.
Calgary Tel: (403) 263-8050
Coutts Head Office
P.O. Box 39
Tlx: 038-39190

AMERICANA BROKERS

• U.S. CUSTOMS BROKERS • SWEETGRASS, MONTANA 59484 • TELEPHONE: (406) 335-2030

June 22, 1984

Mr. David Zygocki
Tri Ocean Engineering Ltd.
222 58th Ave. S.W.
Calgary, Alta., Canada
T2P 2S2

Dear Mr. Zygocki:

This letter is written in response to your inquiry concerning the importation of oilfield goods into the United States. With the following information I have outlined some considerations that should be of interest to you and others who wish to market Canadian products in the U.S.

U.S. Customs Entry

All commercial merchandise imported into the U.S. is subject to U.S. Customs inspection and entry procedures.

A commerical invoice is required if the merchandise is valued over $500.00 U.S. and this document is helpful even if the value is less than $500.00 U.S.

The invoice should adequately describe the merchandise to allow proper tariff classification. It should spell out the terms of sale (e.g., F.O.B. Calgary) and be signed by a knowledgeable person.

Duty & Tariff Considerations

The following are duty rates that have been applied to common oilfield products at this port. It must be stated that these rates are not binding upon Customs. Customs will make a binding tariff ruling, however, at the request of a prospective importer under the provisions of Section 177 of the Customs Regulations.

Product	Tariff Number	Rate
Drilling Rigs & Parts	664.08	3.4%
Lifting & Handling Machinery & Parts	664.10	3.1%
Pumps for Liquids	660.97	3.8%
Steel Gate, Check, Ball or Butterfly Valves	680.17	9.5%
Blow Out Preventers	680.27	4.2%
Shale Shakers	678.20	4.2%
Desilters	661.95	4.5%
Degassers	661.95	4.5%
Special Purpose Vehicles	692.16	4.2%
Steel Camp Buildings	653.00	7.1%
Offshore Platforms & Parts	652.97	7.1%

Generally, merchandise that is of U.S. manufacture and is returning to the U.S. without having been advanced in value in Canada may return to the U.S. without payment of duty.

Articles that are assembled in Canada with U.S. components may return to the U.S. with possible duty exemptions for the value of the U.S. components under tariff item number 807.00. There are many restrictions associated with this type of entry. It is recommended that you contact a knowledgeable source for details before attempting such an entry.

Brokerage Fees

Our fee is determined by the value of the imported merchandise and the type of entry required by U.S. Customs.

Informal Entry (less than $250.00)	$12.00
Formal Entry ($251 and up)	15.00
Single Entry Bond	1.00 per $1,000 (7.50 minimun)
Duty Disbursement Charge	2% of duty

I hope this information will be helpful to you. Please contact me if you have any further questions regarding U.S. Customs clearing procedures.

Sincerely,

AMERICANA BROKERS

William P. McCann

APPENDIX 'N'

PROGRAM FOR EXPORT MARKET DEVELOPMENT (PEMD)

Program for Export Market Development (PEMD)

Programme de développement des marchés d'exportation (PDME)

External Affairs Canada
Affaires extérieures Canada

The Program for Export Market Development (PEMD) helps incorporated Canadian businesses to develop, increase and sustain their activities by sharing with them the costs of specific export marketing efforts. PEMD is geared to:

- encourage businesses that have not exported previously to begin export marketing; and
- encourage established exporters to expand their activities in new markets.

In the 10 years between 1971 and 1981, applications were approved for PEMD assistance to some 15,000 companies for a value of nearly $80 million. Only some $40 million was actually claimed. Reported sales attributable to this PEMD assistance was about $5 billion.

PEMD provides up to 50 per cent of the costs incurred by a company in its penetration of new markets. These contributions are repayable if sales are made to that market.

The Program for Export Market Development has various sections, each designed to meet a specific circumstance which may result while developing or expanding new or existing export markets.

Le Programme de développement des marchés d'exportation (PDME) a pour but d'aider les entreprises canadiennes incorporées à organiser, augmenter et maintenir leurs activités d'exportation en partageant avec elles les frais reliés à certains efforts particuliers de commercialisation à l'étranger. Le PDME vise à:

- encourager les entreprises qui n'ont jamais exporté, à entreprendre la commercialisation à l'exportation;
- encourager les entreprises déjà exportatrices à augmenter leurs activités sur de nouveaux marchés.

Entre 1971 et 1981, le PDME a aidé quelque 15 000 entreprises. Au cours de ces 10 années, cette aide s'est élevée à près de 80 millions de dollars dont seulement 40 millions ont été réclamés. Des ventes d'environ 5 milliards de dollars ont été réalisées grâce au PDME.

Le PDME absorbe jusqu'à 50 % des frais occasionnés par l'implantation sur de nouveaux marchés. Les sommes versées sont remboursables si l'entreprise réalise des ventes sur le nouveau marché.

Le Programme de développement des marchés d'exportation comporte plusieurs sections, dont chacune est conçue pour répondre à des besoins particuliers d'aide à la commercialisation des exportations.

SECTION A: SPECIFIC PROJECT BIDDING

Section A shares the cost of bidding on specific projects anywhere outside Canada. The projects typically involve a formal bidding procedure in competition with foreign firms, for consulting services, engineering, construction and the supply of Canadian goods and services.

SECTION B: MARKET IDENTIFICATION TRIPS

Section B helps companies to undertake market identification trips to potential markets to assess whether exporting to that market would be commercially viable or to make industrial co-operation arrangements.

SECTION C: PARTICIPATION IN TRADE FAIRS ABROAD

Section C helps Canadian exporters to participate in trade fairs and industrial exhibitions outside Canada. Companies may participate in the same (or essentially the same) event up to three times. The events that PEMD supports are generally of limited duration rather than on-going exhibitions.

SECTION D: INCOMING FOREIGN BUYERS

Section D helps Canadian companies to bring potential foreign buyers to Canada, or an approved location abroad. The foreign buyers must represent importers located abroad and must play a major role in influencing purchasing decisions or industrial co-operation agreements.

SECTION E: EXPORT CONSORTIA

Section E encourages Canadian manufacturers to make co-operative arrangements for the development of joint export sales by forming permanent export consortia. It is especially interested in encouraging consortia of small and medium-sized firms. Section E supports feasibility studies of proposed export consortia, as well as the formation and operation of new consortia in Canada for up to three years.

SECTION F: SUSTAINED EXPORT MARKET DEVELOPMENT

Section F helps Canadian exporters to undertake a sustained marketing effort in a foreign market by establishing facilities on location. Under Phase I of Section F, support is provided for market studies and the preparation of a market penetration plan. Under Phase II, the implementation costs determined by the plan may be shared for up to three years.

SECTION A: APPELS D'OFFRES POUR PROJETS PARTICULIERS

La section A permet au Ministère de partager les frais engagés par une société pour soumissionner un projet précis situé à l'extérieur du Canada. Les projets comportent normalement une procédure de mise en adjudication officielle où l'entreprise se trouve en concurrence avec des sociétés étrangères pour les services de consultation, d'ingénierie, de construction et pour la fourniture de marchandises et de services canadiens.

SECTION B: RECHERCHE DE MARCHÉS

Grâce à la section B, les entreprises reçoivent une aide qui leur permet de se rendre sur place pour étudier un nouveau marché et de déterminer si les perspectives d'exportation y sont intéressantes, ou encore pour passer des accords de coopération industrielle. Le genre d'aide accordée dans le cadre de la section B porte par exemple sur des visites effectuées par des représentants de l'entreprise sur le marché visé.

SECTION C: PARTICIPATION À DES FOIRES COMMERCIALES

La section C aide les exportateurs canadiens à participer aux foires commerciales et aux expositions industrielles à l'étranger. Les entreprises peuvent participer au maximum trois fois à la même foire ou à une autre foire similaire. Le PDME accorde de préférence son aide pour participer à des foires et des expositions de durée limitée plutôt qu'à celles qui ont un caractère permanent.

SECTION D: VISITES D'ACHETEURS ÉTRANGERS

La section D aide les entreprises canadiennes à faire venir des acheteurs étrangers au Canada, ou, après autorisation, dans un autre pays. Les acheteurs étrangers doivent représenter des importateurs situés à l'étranger et doivent être en mesure de jouer un rôle important dans les achats ou les accords de coopération industrielle.

SECTION E: CONSORTIUMS D'EXPORTATION

La section E encourage les fabricants, surtout les petites et moyennes entreprises, à former des consortiums permanents d'exportation, dans le but de réaliser des ventes conjointes à l'étranger. L'aide peut s'appliquer à des études de faisabilité de tels consortiums, à leur mise sur pied et à la conduite de leurs affaires pour une période pouvant aller jusqu'à trois ans.

SECTION F: DÉVELOPPEMENT SOUTENU DES MARCHÉS D'EXPORTATION

Le section F aide les exportateurs canadiens à entreprendre des efforts soutenus de commercialisation sur un marché étranger en s'établissant sur place. En vertu de la phase I, on fournit de l'aide pour les études de marché et pour la préparation du plan de pénétration du marché. La phase II permet de partager les coûts de mise en application prévus dans le plan de la phase I, et ce, pour une période pouvant aller jusqu'à trois ans.

PEMD — FOOD: EXPORT MARKETS FOR AGRICULTURE, FISHERIES AND FOOD PRODUCTS

PEMD FOOD assists Canadian companies, producer organizations, marketing agencies and industry associations to develop export markets for agriculture, fisheries and food products. This section supports such traditional export development activities as: market identification, trade fairs, incoming buyers, feasibility and marketing studies, test marketing and trial shipments.

PEMD FOOD will also provide increased scope for, and a more flexible approach to, addressing the specialized export development needs and opportunities of the sector. Assistance may be provided for the organization of commodity groups to undertake commodity promotion. Under appropriate circumstances, assistance may cover capital or operating costs for special production, handling, storage or technical promotion facilities. Long-term market development plans and projects including generic promotion, establishment of overseas representation as well as technical training of individuals from customer countries may also be eligible. Assistance to non-sales organizations may be on a non-repayable basis.

If you would like additional information and/or application forms for any section of PEMD, complete and mail the attached response form to your nearest Department of Industry, Trade and Commerce/Regional Economic Expansion Regional Office (see listing).

PDME — ALIMENTATION: MARCHÉS D'EXPORTATION POUR LES PRODUITS DE L'AGRICULTURE, DE LA PÊCHE ET DE L'ALIMENTATION

Cette section du PDME aide les sociétés canadiennes, les groupements de producteurs, les organismes de commercialisation et les associations industrielles du Canada à pénétrer de nouveaux marchés d'exportation pour les produits de l'agriculture, de la pêche et de l'alimentation. Elle offre une aide aux diverses activités traditionnelles reliées au développement de marchés d'exportation, telles que la recherche de marchés, la participation aux foires commerciales, l'accueil d'acheteurs étrangers, des études de marketing et de faisabilité, des essais de commercialisation ainsi que l'envoi d'échantillonnages.

Le PDME - ALIMENTATION permet une démarche mieux adaptée au développement des exportations et à l'exploitation des débouchés de ce secteur. Une aide peut être accordée pour grouper des marchandises d'un même type afin de réaliser une promotion générique. Dans des cas particuliers, certains frais d'établissement ou de fonctionnement encourus pour une production spéciale, pour la manutention, l'entreposage ou les installations techniques destinées à la promotion peuvent faire l'objet d'une aide. Les plans de développement de marché à long terme, les projets de promotion générique, la mise sur pied d'un service de représentation à l'étranger, ainsi que la formation technique de résidants du pays acheteur, pourront également être admissibles. L'aide aux organisations non commerciales peut être non remboursable.

Pour de plus amples renseignements, ou pour obtenir un formulaire de demande, concernant n'importe quelle section du PDME, veuillez remplir et envoyer la carte-réponse ci-jointe au bureau régional des ministères de l'Industrie et du Commerce et de l'Expansion économique régionale le plus près de chez vous (voir liste).

Please send me additional information and application forms for: (Check all that apply)

☐ Section A: Specific Project Bidding
☐ Section B: Market Identification Trips
☐ Section C: Participation in Trade Fairs Abroad
☐ Section D: Incoming Foreign Buyers
☐ Section E: Export Consortia
☐ Section F: Sustained Export Market Development

PEMD - FOOD: Export Markets for Agriculture, Fisheries and Food Products.

NAME: ______________________________ TITLE: ______________________

ORGANIZATION: ______________________ TELEPHONE: __________________

ADDRESS: ____

____

POSTAL CODE: ____

REGIONAL OFFICES

Newfoundland and Labrador
Parsons Building
90 O'Leary Avenue
P.O. Box 8950
St. John's, Newfoundland
A1B 3R9
Tel: (709) 772-4866
Telex: 016-4626

Nova Scotia
Queen Square
45 Alderney Drive, 11th Floor
P.O. Box 1320
Dartmouth, Nova Scotia
B2Y 4B9
Tel: (902) 426-3458
Telex: 019-22525

New Brunswick
Assumption Place
770 Main Street
P.O. Box 1210
Moncton, New Brunswick
E1C 8P9
Tel: (506) 388-6411
Telex: 014-2200

Prince Edward Island
134 Kent Street, Suite 400
Confederation Court Mall
P.O. Box 1115
Charlottetown,
Prince Edward Island
C1A 7M8
Tel: (902) 566-7400
Telex: 014-44129

Québec
Tour de la Bourse
800, Place Victoria
37ᵉ étage
Case postale 247
Montréal (Québec)
H4Z 1E8
Tel: (514) 283-6254
Telex: 055-60768

Ontario
P.O. Box 98
1 First Canadian Place
Suite 4840
Toronto, Ontario
M5X 1B1
Tel: (416) 365-3737
Telex: 065-24378

Manitoba
400-3 Lakeview Square
185 Carlton Street
P.O. Box 981
Winnipeg, Manitoba
R3C 2V2
Tel: (204) 949-2381
Telex: 07-57624

Saskatchewan
Bessborough Tower
Room 814
601 Spadina Crescent East
Saskatoon, Saskatchewan
S7K 3G8
Tel: (306) 665-4318
Telex: 074-2742

Alberta and Northwest Territories
Cornerpoint Building
Suite 505
10179 — 105th Street
Edmonton, Alberta
T5J 3S3
Tel: (403) 420-2944
Telex: 037-2762

British Columbia and Yukon
P.O. Box 49178
Bentall Centre, Tower III,
Suite 2743
595 Burrard Street
Vancouver, British Columbia
V7X 1K8
Tel: (604) 666-1434
Telex: 045-1191

BUREAUX RÉGIONAUX

Terre-Neuve et Labrador
Parsons Building
C.P. 8950
Saint-Jean (Terre-Neuve)
A1B 3R9
Tél.: (709) 772-4866
Télex: 016-4626

Nouvelle-Écosse
Queen Square
45 Alderney Drive, 11ᵉ étage
C.P. 1320
Dartmouth (Nouvelle-Écosse)
B2Y 4B9
Tél.: (902) 426-3458
Télex: 019-22525

Nouveau-Brunswick
Place Assomption
770, rue Main
C.P. 1210
Moncton (Nouveau-Brunswick)
E1C 8P9
Tél.: (506) 388-6411
Télex: 014-2200

Île-du-Prince-Édouard
134, rue Kent
Bureau 400
Confederation Court Mall
Charlottetown
(Île-du-Prince-Édouard)
C1A 7M8
Tél.: (902) 566-7400
Télex: 014-44129

Québec
Tour de la Bourse
800, Place Victoria
37ᵉ étage
C.P. 247
Montréal (Québec)
H4Z 1E8
Tél.: (514) 283-6254
Télex: 055-60768

Ontario
1 First Canadian Place,
Pièce 4840
C.P. 98
Toronto (Ontario)
M5X 1B1
Tél.: (416) 365-3737
Télex: 065-24378

Manitoba
400-3 Lakeview Square
185, rue Carlton
C.P. 981
Winnipeg (Manitoba)
R3C 2V2
Tél.: (204) 949-2381
Télex: 07-57624

Saskatchewan
Bessborough Tower
Bureau 814
601 Spadina Crescent East
Saskatoon (Saskatchewan)
S7K 3G8
Tél.: (306) 665-4318
Télex: 074-2742

Alberta et Territoires du Nord-Ouest
Cornerpoint Building,
Pièce 505
10179, 105ᵉ Rue
Edmonton (Alberta)
T5J 3S3
Tél.: (403) 420-2944
Télex: 037-2762

Colombie-Britannique et Yukon
Bentall Centre, Tower III,
Pièce 2743
595, rue Burrard
C.P. 49178
Vancouver (Colombie-Britannique)
V7X 1K8
Tél.: (604) 666-1434
Télex: 045-1191

Veuillez me faire parvenir de plus amples renseignements et un formulaire de demande pour:
(cocher les sections qui vous intéressent)

☐ Section A: Appels d'offres pour projets particuliers
☐ Section B: Recherche de marchés
☐ Section C: Participation à des foires commerciales
☐ Section D: Visites d'acheteurs étrangers
☐ Section E: Consortiums d'exportation
☐ Section F: Développement soutenu des marchés d'exportation

PDME - ALIMENTATION: Marchés d'exportation pour les produits de l'agriculture, de la pêche et de l'alimentation.

NOM: ____________________ TITRE: ____________________

ORGANISME: ____________________ TÉLÉPHONE: ____________________

ADRESSE: ____________________

CODE POSTAL: ____________________